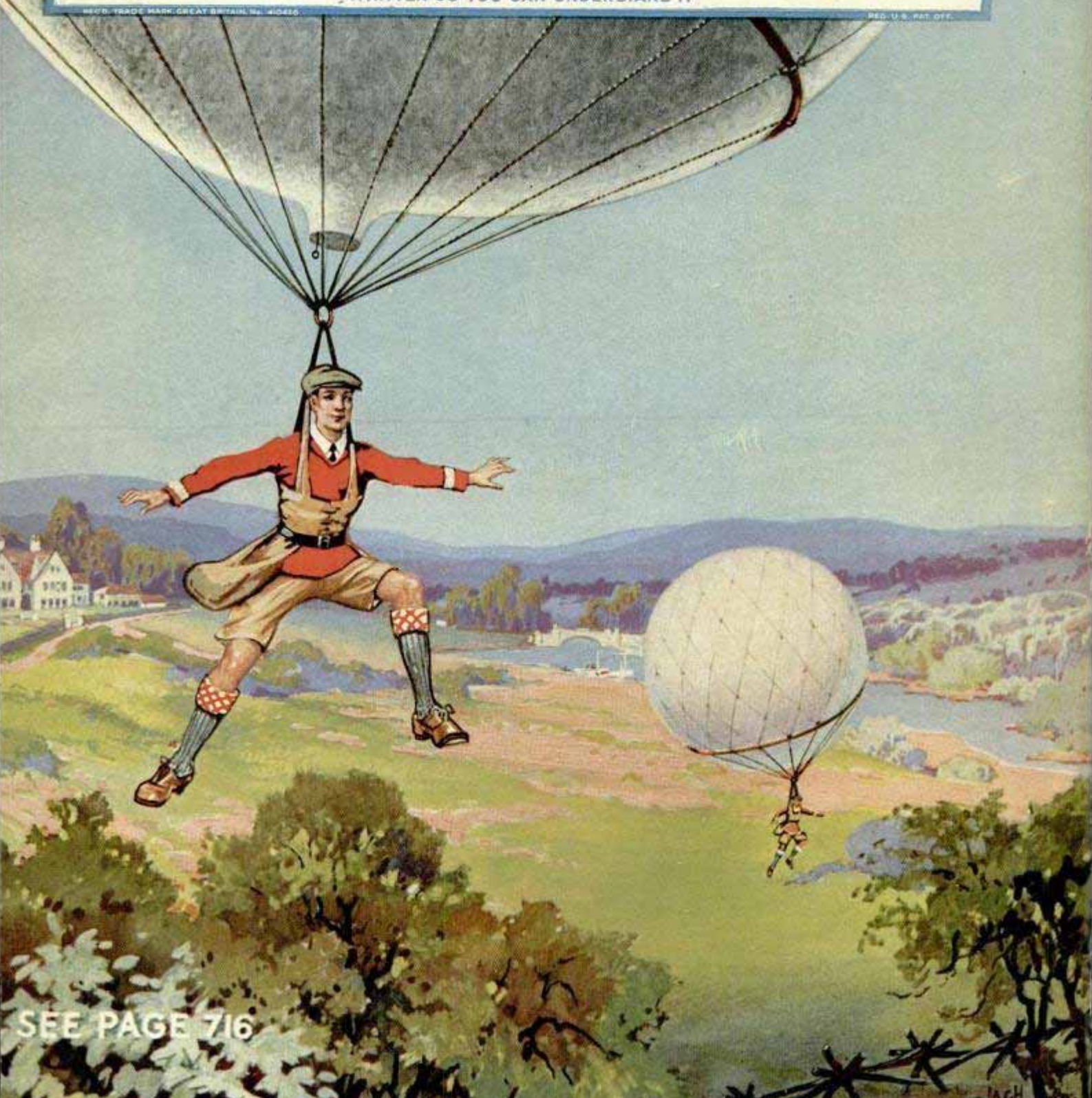


POPULAR MECHANICS

MAGAZINE

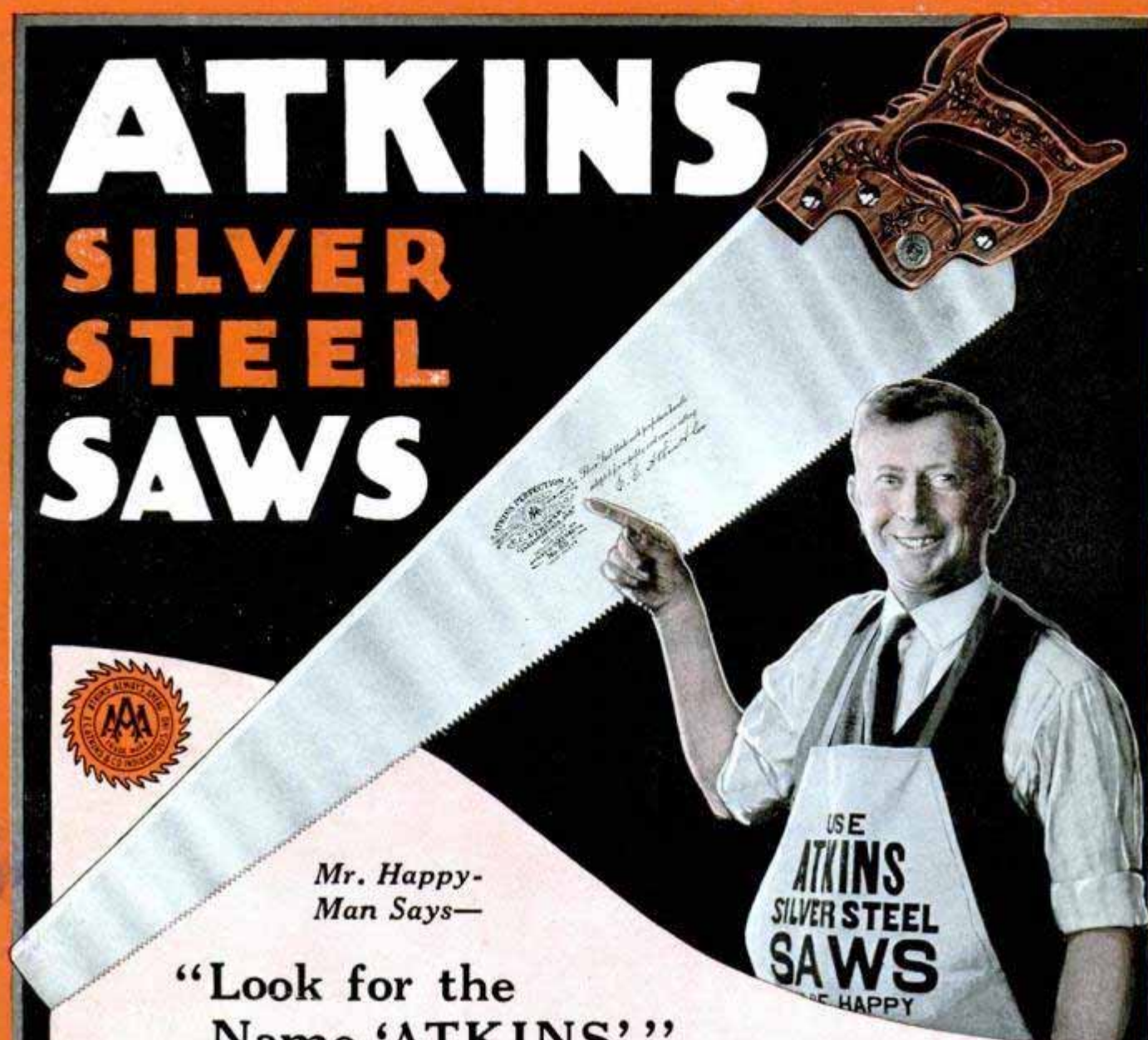
WRITTEN SO YOU CAN UNDERSTAND IT!



SEE PAGE 716

ATKINS

SILVER STEEL SAWS



*Mr. Happy-
Man Says—*

**“Look for the
Name ‘ATKINS’”**

WHEN you buy a saw, look for the ATKINS name on the blade. It guarantees you a better saw—one that will save you time, money and labor every day you use it.

Your hardware dealer will show you a genuine ATKINS “Silver Steel” Saw ready for a lifetime of better service in your home, or in your work. It not only cuts easier and faster, but outwears many “cheap” saws.

No matter whether you want to cut wood, metal, stone, bone or any other material—there’s an ATKINS Saw ready to give better service. Ask for our free folder, “Saws in the Home,” or “Saws on the Farm.” YOUR dealer will gladly show why “It Pays To Buy Better Tools!”

E. C. ATKINS & CO., Est. 1857 426 S. Ills. St., Indianapolis, Ind.
Leading Manufacturers of Highest Grade Saws for Every Use; Saw Tools, Saw Specialties, Plastering Trowels, Machine Knives, Grinding Wheels and Files.

Conn Saxophone Superiority

is based upon *Exclusive Features*



This photograph of Dreschers Saxophone Boys, Houston, Tex., is typical of many saxophone bands, completely equipped with Conns. Membership in such a band gives both pleasure and profit.

EVER since Conn built the first saxophone ever produced in America—under the supervision of that great artist, E. A. Lafebre—Conn leadership in this important field has been maintained.

Exclusive features, improving quality and making easier playing, have caused a great host of the foremost saxophonists to use the Conn saxophone exclusively.

The accompanying view shows a section of the final assembly and padding department at the Conn factory—only about one-third of the entire department. Here skilled padders and adjusters work under the supervision of two experts, one of whom has been with Conn for 40 years and was the first padder and adjuster, and the other was with the Sousa band for a number of years. Both supervisors pass upon every saxophone before shipment.



Start now to cultivate your musical "bump" with a Conn. Play solos, in orchestra or saxophone club like the one illustrated—win pleasure, popularity, increased income.

FREE TRIAL, EASY PAYMENTS
on any Conn instrument for band or orchestra. Send coupon for literature and details.

VIEW of a section of the Saxophone final assembly and padding department of C. G. Conn, Ltd.

CONN
BAND
INSTRUMENTS
WORLD'S LARGEST MANUFACTURERS

C. G. CONN, Ltd.,
531 Conn Bldg., Elkhart, Ind.
Gentlemen: Please send literature and information about trial offer on
(Instrument) _____
Name _____
St. or R. F. D. _____
City, State _____
County _____

CULTIVATE YOUR MUSICAL "BUMP"



You may "kid" the "cold-bath liar" *but you envy him one thing*

YOU know him—the "cold-bath liar." He brags, offensively, about the bracing, stimulating, zestful feeling he gets when he tumbles out of a nice warm bed and jumps under the icy shower. He gets by with a reputation for being antiseptically clean.

How about yourself? Have you recently shoved your own familiar face up close to a truthful mirror for a good honest look? Try it. You are due for a surprise and a couple of shocks. You are going to discover that your face is really not quite clean.

That off-color, almost-but-not-quite-clean look about your skin is caused by ordinary, unpleasant dirt. It comes from the air. The

U. S. Weather Bureau estimates that there are 115,000 swirling bits of dust and grime in one cubic inch of city air. These invisible bits of smoky grime collect upon your face, in tiny wrinkles and open pores. Once there, they resist every effort of soap and water to get them out.

You can get clean—and stay clean. A Pompeian massage in your own home takes only seventy seconds—no more time than a hot towel and rinse. Use this invigorating massage cream after shaving, for that stimulating, zestful "feel." Use it to get clean, stay clean; then absorb some of the glory that gravitates to the cold-bath enthusiast.

Above all, use it for the grand and glorious feeling that, by gosh! you really are clean!

MAKE THIS CONVINCING TEST!

Wash your hands thoroughly. Rub a little Massage Cream into the back of your hand. Keep rubbing. The cream goes in pink and comes out black! The black is dirt you couldn't remove by washing. Make this simple but convincing test today. Get a jar of Massage Cream in any drug store—60c. Mail the coupon below for sample.



FREE—TO MEN ONLY

The Pompeian Company, Dept. 47, Cleveland, Ohio. Please send me free, the sample tube of Massage Cream, with enough cream to make the hand test, and to give me several massages.

POMPEIAN MESSAGE CREAM

Increases Your Face Value

Name _____

Street _____

City _____ State _____

Popular Mechanics Magazine

200 E. Ontario Street, Chicago, U. S. A.

H. H. WINDSOR, Founder

H. H. WINDSOR, Jr., Editor and Publisher

London: Hachette & Cie.,
16-17 King William Street, Charing Cross, W. C. 2

Paris: Hachette & Cie.,
111 Rue Reaumur

Melbourne: Gordon & Gotch
509-513 Little Collins St.

ISSUED MONTHLY

SUBSCRIPTION:

SINGLE COPY, 25 CENTS

In United States and its possessions, also Canada, Cuba, and Mexico, per year, postpaid - \$2.50

To all other countries in the Postal Union - 3.00

All subscriptions are discontinued at expiration. Please examine the date printed on your wrapper.

Entered as Second Class Matter Sept. 15, 1903, at the Post Office at Chicago, Illinois, under Act of March 3rd, 1879.

Entered as Second Class Matter at the Post Office Department, Canada.

Published monthly by POPULAR MECHANICS CO.

Copyright, 1927, by Popular Mechanics Co.

Copyright in Australia. Copyright in France

Vol. 47

Contents for May, 1927

No. 5

Advertising—queer way of	756	Fire	electric alarm for home	720
Airplanes			old watch tower	768
folding wing bomber	785		wire detects	792
tiny, flies 40 miles on gallon of fuel	736	Fireplaces—of cast stone	800	
Animals—doctoring at zoo	782	Fish—cooked in jackets	797	
Archæology—secrets of ancient race sought in Georgia	811	Fishing—the how and where of	772	
Ark of the Covenant—copy of	754	Flowers—of rubber	823	
Army—United States		Game—disk teaches children reading and arithmetic	733	
model of improved barracks	752	Garden—magic from chemicals	824	
reduce weight of pack	710	Gas		
Artist—armless	749	electric detector prevents explosions	742	
Athletics—gymnasium outfit for home	817	rock for running autos	759	
Automobile		Gavels—making for congress	800	
converted into home for touring	780	Gun—for left eyed shooter	807	
looping the loop in made less dangerous	707	Hat—protector for rainy days	811	
service station modeled after mosque	713	Heater—portable electric radiator	777	
Automobiles—Equipment and Supplies		Horses—help in beaching boat	734	
brake testing clutch	785	Hospital		
hand warmers snap on steering wheel	747	model for treating race horses	810	
lift for raising	801	twenty-two story	718	
shock absorber, three piece	816	Hour Glass—times phone call	741	
Automobiles—Fuel		Houseboats—along the Bronx	721	
automatic supply system	720	Household devices	814	
research cuts gas bill	709	House Moving—eight-story building	770	
Automobiles—Lighting		House Plan	880	
dazzle mirrors tell autoist to dim headlights	758	Ice—rear-control auto truck	732	
headlamps dip when light strikes them	813	Indians (Brazil)—mystic rites revealed by masks	743	
rubber caps on lamps aid driving	711	Lamps—floor, cord winds up	733	
tail lights of rubber	797	Lamps—Globes—wood blocks used as, in rustic theater	817	
Automobiles—Tires—pop valves for	765	Language—new speech code in numbers	787	
Automobiles—Wheels—tester to aline	753	Lemon—large, raised indoors	746	
Aviation		Lifeboat—of basket work for greater safety	715	
air tank tests aviators and instruments	765	Light—ultraviolet ray treatment of food	769	
seeing Europe from an air liner	722	Lightning—travels in spirals	769	
stunt flyer drives plane through shed	711	Lightship—"Royal Sovereign" sends radio fog signals	801	
woman rides with wolf on airplane wing	812	Lock—for door key	822	
Balloon—seven league boots of jumper	716	Locomotive		
Baseball—pitching whip	787	old domes kept on "hatrack"	753	
Bells—hobby of collecting	771	U. P. 9000-type and "Oregon Pony" compared	778	
Belt—stretchless, uses old rubber	721	Magic—with matches	803	
Birdcage—sign in Paris	749	Mine—old, is refrigerator	811	
Brick—circular for chimneys	812	Mirror—broken, spurs invention of beauty aid	733	
Camping		Models—engine made in bottle runs by compressed air	783	
folding toilet kit	786	Monument—for apple tree and grower	797	
joys of the open road	760	Motor—variable stroke	784	
Card Case—single handed	787	Motorboat—rudder in air guides air-propelled boat	824	
Cathedral—snow built by Eskimos	720	Motor Buses		
Cement—loaded on lake boats by air blast	742	conquering Alps	767	
Chemistry—what it is doing for you	818	replacing camel in desert	759	
Clock—on watchmaker's car attracts attention	741	turntable for, speeds traffic	793	
Coal—new refining process promises cheaper gas	771	Motorcycle		
Cross-Eyes—cure for in exerciser	713	fire engine	809	
Cushion Covers—that open up	776	fort for police	718	
Dam—floating, is removable	780	Moving Pictures		
Death Ray—can sound kill	705	how great battle scenes are re-enacted	750	
Dock Gate—looks like skyscraper	712	recorded on phonograph	771	
Dogs		rubber elephant doubles for live animal	788	
exercise on treadmill	708	talking, photograph voice in film	719	
famous mascot stuffed	759	Music—tunes played by light rays	752	
Dolls—from heathen idols to playthings	738	Musical Instruments—electric tools for violin maker	708	
Duplicator—hand size letter	735	Navigation—echo sailing in the north	794	
Elastic—spring wire cloth substitute for rubber	735	Navy—U. S.—storm cap for nurses	767	
Electric Insulation—ripper to cut	758	Paints—for auto from ocean	714	
Engine—old steam abandoned on desert	736	Paper		
England—how to keep soldiers fit	799	milk bottle of	821	
Excavation—ball and socket trench brace	786	use of waste	753	
Farm Labor—would cut farmer's year to twenty days	741			

[Continued on Page 4]

Perfume—as antiseptic	793
Petroleum—new oil fields found beneath old	766
Phonograph—light weight, portable, has paper speaker	813
Photography	
cameraman risks life in getting pictures	822
paste of photo chemicals in tubes	778
Polishing Pad—motor driven	768
Radio	
to link oil stations in tropics	710
trouble shooters	748
Radio—Aerials	
adapting loop set to outside	836
insulator prevents leaks	836
Radio Apparatus	
"back panel" dial beautifies set	832
jack in outlet plate	832
noiseless trickle charger	831
variable a. f. transformer	836
vice for builder	838
Radio Application	
immigrant girl learns English by listening to radio	802
sailor's eye saved by magnet built by radio advice	770
Radio Batteries	
A and B-eliminator	831
A and B-power combined	825
B-current from A-battery	838
loose cell	825
using auto battery for set	835
water bulb for storage	836
Radio Broadcasting	
advice helps farmers	812
from airplane	807
Radio Crystal Sets	
in Ireland gets U. S.	822
replacing crystals	832
Radio Engraving Machine—make your own	833
Radio—Loud Speakers—what you should know about	826
Radio—Pictorial—radio happenings far and near	837
Radio Receivers	
eliminating whistles	838
tests for loose connections	831
Radio Tubes	
improvised protector for	832
supersensitive detector	836
Railroad—lighted chart of "L" system	747
Railroads, U. S.—roadside signals shown in engine cab	806
Razor—safety, bathtub for	755
Refrigeration	
dry ice in fruit cars cuts shipping costs	800
railroad diners iced electrically	713
Restaurant—cafe in form of hat	710
Rule—measuring rod coils into vest pocket case	758
Safe—anchored theater office	779
School—in railroad car in Canada	755
Sculpture	
Indian carves animals from stumps	793
movie of model saves time	715
Sharks—are cowards	824
Ships	
American sailing, still search seas for treasure	808
fifteen inch hawsers	823
motor has electric "cow"	742
"Washington Irving" raised by cofferdam	802
Shotgun Shot—copper-plated	792
Sign—turned by tiny airplane	706
Silhouettes—animal cut by crippled boy	784
Skyscraper—how, resists rust shown in old building	801
Smokestack—as banquet hall seats fifty	714
Snowplow—has two rotor blades	802
Statue—centuries old marks scene of plague	746
Steel—bar with turning core can't be sawed through	737
Submarine—docked by locomotive	709
Swimming Chute—model of	720
Swing—hobbyhorse	779
Switch—time, for household use	813
Tank—oil protected by poles and screen from lightning	798
Telephones—keeping, from blowing up coal mines	737
Tunnel—under Stevens pass	816
Varnish—protects stone	749
Vulcanizer—electric tire run from light socket	770
Weather	
making your own	743
posts in far north	767
station in Death Valley	808
Weather Survey—exploring home of north wind	781
Windlass—homemade	777
Woman—invents airplane motor	708
Women's Dress—hand painted velvet gowns	797
X-Rays	
metal in "Shenandoah" found poor by	798
mysteries of past explored by	735

AMATEUR MECHANICS

Automobiles—Equipment and Supplies—lowering mirror	844
Automobiles—Fuel—anti-knock compound saves gasoline	851
Automobiles—Lubrication—oiling springs	841
Baby Gocart—baby bed and walker combined	843
Birdhouses—for garden	855
Boats and Boating—one-man raft	841
Bottles—quick method of labeling	859
Camera—rubber feet for tripod	851
Camping—protectors for iron tent stakes	844
Cement—for metal and glass	859
Clothesline—pole of piping as lawn sprinkler	842
Curtain Hanger—bracket on broom handle	852
Easel—adjustable on camera tripod	859
Fire—removing effects of with chemicals	850
Flower Bed—unusual	852
Flytrap—made from flowerpot	854
Furniture—how to polish	840
Glass Stoppers—removing	851
House Furnishings	
door closer from mousetrap	842
valance boards	839
Icebox Drain—vermin proof	844
Lawn—grading	852
Music Box—mysterious	860
Paints and Painting	
black for auto tires	852
flexible shellac	841
how to paint new work	842
Photography—abrasion marks on prints	840
Porch—mail box and storage box in	844
Range Boiler—easy way to empty	854
Sawhorse—slotted saves time	850
Saws and Sawing—homemade bandsaw	853
Ship Models—how to use and read ship drawings	845
Smokers' Accessories—coconut ash receiver	860
Umbrella—to increase life of	851
Vise—workbench from auto jack	854
Washers—how to cut mica	860
Water—air leaks in the pressure tank	853

SHOP NOTES

Agriculture—knocking down corn stalks	875
Automobiles	
blocking in freight cars	869
how to repaint like an expert	870
Automobiles—Repairing	
leaky gasoline line	879
replacing broken spring leaf	875
Bee Stings—pocket kit for	867
Carpentry	
proper width of stair treads	878
sawing crooked boards straight	876
Concrete—restoring oil stained	863
Culverts—jacked through embankments	868
Emery Belt—substitute for wheel	863
Engine—starting two-cycle	877
Farm Gate—counterweight on	875
Flies—birds keep from cattle	869
Garage—oil dispenser for	878
Hose Reel—carried on top of air compressor	876
Insulation—removing from wire	879
Logging—single team hauler	879
Milk Cans—tool for removing covers	866
Molding—grooving with circular saw	864
Motor Trucks—hook on springs for lifting loads	865
Nail—preventing streaks on siding	867
Photography	
drying films quickly	868
protecting tools against chemicals	864
repairing enameled trays	876
repairing plate holder slide	863
Pulley—to fit any shaft	869
Railroads—spike holes, plastic filling for	864
Rheostats—doubling capacity of slide	878
Rifle—cleaning rod	865
Rivets—dolly for backing	864
Rubber Cuffs—for work-clothes	876
Rust—removing from steel	862
Safety Devices	
dirt catcher on cold chisel	869
for blowing down locomotives	875
gas engine exhaust pipes	876
Screwdriver—double service	864
Sewing Machine—built-in	861
Shears—for sheet metal	867
Trash Box—compact	863
Trees—grafting fruit	866
Truck—automatic dumping	877
Try Square—improved	867
Valve—spring compressor	877

Rubber Springs were a

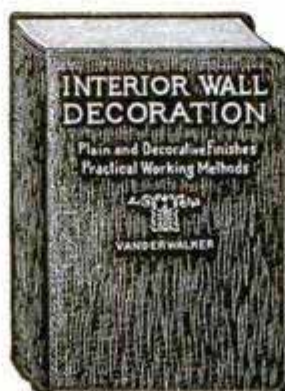
New Ideas on Home Decoration

WHETHER you are a practical decorator, furniture finisher, design artist or only a home owner, these practical books will give you new and up-to-date methods of securing the most beautiful effects. Each book fully illustrated. By their help you can secure results worth many times the cost. Study the list:



FURNITURE, FURNITURE FINISHING, DECORATION AND PATCHING

Period Furniture and Modern Styles, etc., illustrated and described and methods of finishing explained. A new invaluable book. 400 pages, cloth, \$5.00.



INTERIOR WALL DECORATION

The new artistic and novelty finishes and how they are obtained. New ideas for home owner and decorator. 450 pages, leatherette, \$4.00.



STUDIO HANDBOOK—LETTER AND DESIGN

A new book for artists and others, with every conceivable style of letter and design. Invaluable to advertisers. 233 pages, leatherette, \$3.00.

The Ross Crane Book of Home Furnishing and Decoration	\$3.00
Mixing of Colors and Paints	2.00
Wood Finishing, Plain and Decorative	2.00
House Painting Methods	2.00
The Art of Sign Painting	4.00
Scene Painting and Bulletin Art	4.00
"A Show At" Sho' Cards	4.00
Art of Show Card Writing	4.00
Strong's Book of Designs	4.00

New Stencils and Their Use	\$1.25
Automobile Painting	1.50
Modern Painter's Encyclopedia	2.00
Estimates, Costs and Profits	1.50
New Hardwood Finishing	1.50
The Signist's Modern Book of Alphabets	1.50
The Amateur Artist	1.50
Owens' Paint Guide	1.00
Chalk Talk and Crayon Presentation	1.25
Graining and Marbling75

We also publish over 200 pay-raising books on **Electricity, Automobile construction, care, maintenance and painting, Machine Shop Practice, Steam Engineering, Railroading, Carpentry and Building, Business, Bookkeeping, French, Spanish and German Without a Teacher, General Instruction and Reference Books, Handbooks, Farm Books, etc.** All fully described in catalog **SENT FREE**. Write today.

FREDERICK J. DRAKE & CO.

Publishers

1008 Michigan Ave. CHICAGO

Drake Books Are for Sale at All Book Stores

Frederick J. Drake & Co.,
1008 Michigan Avenue,
Chicago, Ill.

Gentlemen:

☐ I enclose \$..... for which send me postpaid the books checked on this page.

☐ Please send me, free, postage paid, your illustrated catalog which lists and describes over 200 Practical Mechanical Books for Home Study.

Name.....

Address.....



01 85-EYH-59111

How high will you climb in the next four years?



Davenport Machine Tool Co.

Incorporated

W. S. DAVENPORT
Pres. & Genl. Manager
C. R. BURT
Vice-President
A. T. HATCH
Treasurer

Automatic Screw Machines

167 Ames Street
Rochester, N.Y.

CABLE ADDRESS
DAVEPORT
LIEBERS, 5 LETTER CODE

LaSalle Extension University,
Chicago, Illinois.
Gentlemen:

I was no longer a young man (in years at least) when I started training with LaSalle four years ago. I was, in fact, well on in the forties, and had practically no knowledge of accounting. Yet entirely as a result of this training, in a period of less than three years, my salary increased over 300 per cent.

There are thousands of men thruout this country—men in the forties or early fifties, with the mature judgment that the years bring, but without special training in any particular lines—who could double and triple their earning capacity in a short time thru LaSalle specialized training.

And for the young man, who is just getting a foothold in the business world, LaSalle Extension University specialized training is the most profitable investment he could possibly make.

Very truly yours,

R. M. Whitney

Auditor

JUST a single rung in his ladder of success was missing—the rung of **training**. Yet that single rung kept R. M. Whitney, at 47, from climbing higher than a clerkship—kept him from making more than \$30 a week—

Then in four years he made up for twenty years of lost opportunity!

Enrolled with LaSalle Extension University for home study training in Higher Accountancy, he completed the course in only five months. Almost immediately came the offer of a better job.

Less than three years later, the Davenport Machine Tool Company, of Rochester, N.Y.—**the very company he had worked for as a clerk**—invited him to come back on his own terms. He returned as Auditor, at a salary-increase of better than 300 per cent.

Little wonder that he speaks of LaSalle special-

ized training as the most profitable investment that a man can make.

These Free Books Show How

The books that showed R. M. Whitney what he must do to climb from his \$30-a-week job to his present high-salaried position are yours for the asking. They are—"Accountancy, the Profession that Pays"—and—"Ten Years' Promotion in One."

If these two books can place you on the upward route to greater earning power—as they have done for literally thousands of LaSalle-trained men—you'll agree they would be cheap at \$100—even \$1,000 . . . Yet LaSalle will send them to you free.

Balance the two minutes that it takes to fill out the coupon against the rewards of a successful career—then clip and mail the coupon NOW.

Find Yourself Thru LaSalle!



LA SALLE EXTENSION UNIVERSITY, Dept. 564-HR, CHICAGO

I shall be glad to have your 64-page booklet about the business field I have checked below. Also a copy of "Ten Years' Promotion in One," all without obligation.

- | | |
|---|--|
| <input type="checkbox"/> Higher Accountancy | <input type="checkbox"/> Traffic Management—Foreign and Domestic |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Railway Station Management |
| <input type="checkbox"/> Modern Salesmanship | <input type="checkbox"/> Banking and Finance |
| <input type="checkbox"/> Law; Degree of LL. B. | <input type="checkbox"/> Personnel Management |
| <input type="checkbox"/> Commercial Law | <input type="checkbox"/> Modern Business Correspondence and Practice |
| <input type="checkbox"/> C. P. A. Coaching for Advanced Accountants | <input type="checkbox"/> Expert Bookkeeping |
| <input type="checkbox"/> Effective Speaking | <input type="checkbox"/> Business English |
| <input type="checkbox"/> Modern Foremanship | <input type="checkbox"/> Commercial Spanish |
| <input type="checkbox"/> Industrial Management | |

Name _____ Present Position _____

Street _____ City _____ State _____

these books free

ELECTRICITY

Complete Study Course and Pocket Library \$10



SHIPPED FREE

A set of **HAWKINS GUIDES** is a true friend to the electrical worker. It tells you how to do any job the right way—without guessing or taking chances.

Hawkins Guides put all the facts about modern electrical engineering at your finger tips. Therefore your chances for advancement in the electrical field are unlimited.

HAWKINS GUIDES DOUBLE YOUR VALUE



Electricity is king!

It is the ruling force of today—transportation, communication, light, heat, power—indeed every modern activity is dependent on electricity. Industry is crying for electrical men that know their jobs!

Hawkins Guides teach you all you need to know about electricity in easy, step-by-step lessons. Daily spare time reading of the Guides will greatly increase your value to yourself and your employer in a few weeks. Hundreds of our friends have written us and told us this!

ing of the Guides will greatly increase your value to yourself and your employer in a few weeks. Hundreds of our friends have written us and told us this!

READERS OF HAWKINS GUIDES KNOW HOW



"You can't stump him on an electrical job."

"He certainly knows his business." "Certainly have to hand it to him for knowing how."

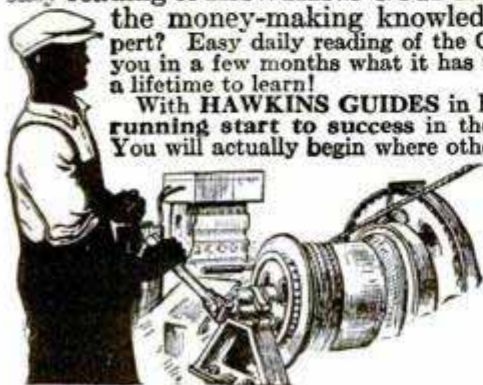
—These are the things employers say about our friends who are readers of **Hawkins Guides**.

No matter what question or problem comes up the Ready Reference Index enables you to give an expert answer at once.

HAWKINS STARTS YOU WHERE OTHERS LEFT OFF

Why should you work at low wages when easy reading of **HAWKINS GUIDES** will give you the money-making knowledge of the expert? Easy daily reading of the Guides will teach you in a few months what it has taken the expert a lifetime to learn!

With **HAWKINS GUIDES** in hand you have a running start to success in the electrical field. You will actually begin where others left off!



NOW!

This coupon is your golden opportunity. Tear it out—send it now!

FOR EXAMINATION!

REAL ELECTRICAL EDUCATORS

"Hawkins Guides at \$10 is the best investment I have ever made. Am able to take up almost any electrical job and have never gone to an electrical school."—B. Roessler, Oenaville, Texas.

AS EASY AS A. B. C.

"Everything in Hawkins Guides is very plain and anybody can read and understand them as easy as A. B. C."—J. Knight, Tobyhanna, Pa.

OTHER ENTHUSIASTIC READERS SAY

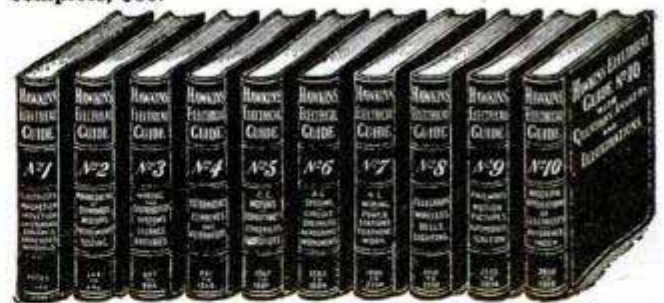
"Worth ten times their price." "Helped me to two raises in four months." "Better than a school of instruction." "Studied them when I was laid up and got further ahead than if I had been on the job."

Hawkins Guides Explain These Points So You Can Easily Understand:—

Magnetism—Induction—Experiments—Dynamometers—Electric Machinery—Motors—Armatures—Armature Windings—Installing of Dynamos—Electrical Instrument Testing—Practical Management of Dynamos and Motors—Distribution Systems—Wiring—Wiring Diagrams—Sign Flashers—Storage Batteries—Principles of Alternating Currents and Alternators—Alternating Current Motors—Transformers—Converters—Rectifiers—Alternating Current Systems—Circuit Breakers—Measuring Instruments—Switch Boards—Wiring—Power Stations—Installing—Telephone—Telegraph—Wireless—Bells—Lighting—Railways. Also many Modern Practical Applications of Electricity and Ready Reference Index.

Hawkins Guides—10 POCKET SIZE NUMBERS

Each number easy to carry around and read in spare time. Big type and clear diagrams. Easy to study and learn. Durable, flexible binding—gold edges. 3,500 pages—4,700 illustrations. Shipped free for examination. Pay only \$1 a month if satisfied. Price of set, complete, \$10.



EXAMINE GUIDES FREE! \$

Let the Guides themselves demonstrate their practical value to you—as a study course, reference work and complete electrical library. You are the judge. Simply send this coupon. No obligation unless you are entirely satisfied. Tear out on dotted line—fill in—mail it NOW!

\$1
PER
MO.

**FREE
EXAMINATION
COUPON**

Theo. Audel & Co., 65 W. 23rd St., New York City

Please send me (postpaid) for my approval **Hawkins Electrical Guides**, 10 numbers (price \$1 each). If satisfactory I will mail you \$1 in 7 days and further mail \$1 monthly until purchase price of \$10 is paid.

Name!.....

Address.....

Occupation.....

Employed by.....5T30



"I Used to Earn Only \$25 a Week— But it's \$50 to \$75 Now!"

"BEFORE starting your course," writes Mr. James T. Summers of Statesville, N. C., "I knew nothing about auto repair work. I have only a common school education but find your training so clear and easy that a child could understand them. I now own a good, paying business. Before taking your course, I made only \$25 a week. Now I make \$50 to \$75 and have good prospects for the near future."

GET ALL THE FACTS!

If you're earning a cent less than \$60 a week, get my Free Book now! See the amazing opportunities for **Quick Raises in Pay in Automotive Field!** See how men like W. S. Yancy, Perla, Ark., can have their salaries boosted from \$30 a week to \$90 a week!

LEARN HOW I TRAIN YOU AT HOME

Don't sell your time for low pay! *You don't need to.* Get my Free Book. Find out how you can become a Big Pay Auto man in **quick time!** Keep your present job. Stay home. You don't have to leave your doorstep. Master every Branch of Auto Work *right in your own home.* See how I train you **QUICKLY and EASILY** to **BOSS** the Job, or **GO INTO BUSINESS** where Big Pay comes **QUICK**—and up to \$10,000 a year can be made!

The World's BIGGEST BUSINESS Needs You!

Get Into this gigantic Auto Business! **IT NEEDS YOU!** Think of it—*5 Thousand Million Dollars* paid to Auto Men *every year* for upkeep alone! That's why there are *so many Opportunities for Big Raises in Pay QUICK* for the trained Auto Man—opportunities waiting for YOU! If you want to *boost your pay QUICK, clip coupon now.* Common schooling all you need. I help you do it. I give you Lifetime Employment Service—Lifetime Consultation Service too!



FREE
AUTO BOOK
Send Coupon!

CLIP COUPON NOW!

Send for this amazing **FREE BOOK** *right NOW!* See how hundreds of men who never had a day's previous Auto experience before writing for my book—and others who had years of experience—are *boosting their salaries, making Big extra Spare-time money,* and getting into *Money-Making Businesses* of their own **QUICK!** Get all the facts! Send Coupon Now!

B. W. COOKE, Directing Engineer, Chicago Motor Training Corp., 1916 Sunnyside Ave., Dept. 516, CHICAGO

B. W. COOKE, Directing Engineer,
Chicago Motor Training Corp.
1916 Sunnyside Ave., Dept. 516, Chicago

Send me **FREE** Auto Book and proof that you will put me in line for a good job as an Electrical and Mechanical Auto Expert. Also send your 4 Outfits Offer. It is understood that this obligates me in no way.

Name.....

Address.....

City..... State.....

Get the Full Details of My 4 WORKING OUTFITS OFFER

Includes Tools, Tool Bag, Electrical Test Bench, also Special Electrical Experimental Outfits. Also 303 Wiring Diagram Charts.

Only 28 years old and earning \$15,000 a year



Works in Shoe Factory

W. T. Carson was forced to leave school at an early age. His help was needed at home. He took a "job" in a shoe factory in Huntington, W. Va., at \$12 a week.



Starts Studying at Home

Carson determined to make something of himself before it was too late, so he took up a course with the International Correspondence Schools and studied in spare time.



Now Owns Big Business

Today W. T. Carson is the owner of one of the largest battery service stations in West Virginia, with an income of \$15,000 a year. And he is only 28 years old!



Lectures at College

Just a few months ago a large college asked Carson to lecture before a class in electricity. That shows the practical value of his I. C. S. course.



How to Earn More Money

If the I. C. S. can smooth the path to success for men like W. T. Carson it can help you. If it can help other men to earn more money it can help you too.



The Boss is Watching You

Show him you are ambitious and are really trying to get ahead. Decide today that you are at least going to find out all about the I. C. S. and what it can do for you.

Mail This Coupon for Free Booklet

INTERNATIONAL CORRESPONDENCE SCHOOLS, Box 5646-E, Scranton, Penna.
Without cost or obligation, please send me one of your booklets and tell me how I can qualify for the position or in the subject before which I have marked an X:

- ☐ Business Management
- ☐ Industrial Management
- ☐ Personnel Organization
- ☐ Traffic Management
- ☐ Business Law
- ☐ Banking and Banking Law
- ☐ Accountancy (including C.P.A.)
- ☐ Nicholson Cost Accounting

BUSINESS TRAINING COURSES

- ☐ Bookkeeping
- ☐ Private Secretary
- ☐ Spanish
- ☐ French
- ☐ Salesmanship
- ☐ Advertising
- ☐ Business Correspondence
- ☐ Show Card Lettering

TECHNICAL AND INDUSTRIAL COURSES

- ☐ Electrical Engineering
- ☐ Electric Lighting
- ☐ Mechanical Engineer
- ☐ Mechanical Draftsman
- ☐ Machine Shop Practice
- ☐ Railroad Positions
- ☐ Gas Engine Operating
- ☐ Civil Engineer

- ☐ Surveying and Mapping
- ☐ Metallurgy
- ☐ Steam Engineering
- ☐ Radio
- ☐ Architect
- ☐ Blueprint Reading
- ☐ Contractor and Builder
- ☐ Architectural Draftsman

- ☐ Stenography and Typing
- ☐ Good English
- ☐ Civil Service
- ☐ Railway Mail Clerk
- ☐ Common School Subjects
- ☐ High School Subjects
- ☐ Illustrating
- ☐ Cartooning

- ☐ Concrete Builder
- ☐ Structural Engineer
- ☐ Chemistry ☐ Pharmacy
- ☐ Automobile Work
- ☐ Airplane Engines
- ☐ Navigation
- ☐ Agriculture and Poultry
- ☐ Mathematics

© 1927

Name.....

Address.....

Canadian address—International Correspondence Schools Canadian, Limited, Montreal



Sounds The Call For Young Men

YOUR pulse leaps at the sound of that magic word "Aviation." A new kind of job... away from the humdrum monotony of stifling shops and offices. The joy of breathing pure outdoor air. The applause of admiring crowds. And now that aviation is coming to the front—NEW OPPORTUNITIES and a WONDERFUL FUTURE!

What Aviation Offers You

Aviation isn't like the old crowded professions and trades with five men seeking every job. IT'S NEW! Its future is just around the corner. Here's why:

One of the big industrial problems in America today is FASTER TRANSPORTATION. Within a few years you should see giant passenger and freight liners criss-crossing the country like the railroads today. Big cities are already establishing airport sites. Already, Wanamaker's noted New York Store, it is said, has started an air delivery service to Florida. Already men like Henry Ford have invested millions in Aviation! Almost every day your newspapers tell you of the big things in store for aviation—and for men who enter the field NOW!

Easy to Learn

The less you know about Aviation, the more apt you are to think that it's some strange technical science that requires high education and pre-mechanical training. But, now, by a new easy method of home instruction, its basic principles are made so plain that you can't fully realize the simplicity of it all until you see the first few lessons. One student, S. F. McNaugh-

ton, says: "Your lessons are like a romance. One never gets tired of reading them." And it's thoroughly practical. Men who have had actual experience in Aviation direct your training. You don't have to quit your present job—you can go right ahead earning while you learn.

Pick Your Job!

Airplane Instructor
Airplane Engineer
Airplane Repairman
Airplane Assembler
Airplane Mechanician
Airplane Inspector
Airplane Builder
Airplane Salesman
Exhibition Manager
Airplane Contractor
Airplane Motor Expert
Airplane Designer

Big Aviation Book—FREE

Those who got in early made the real money in the fields of motion pictures, automobiles, and radio. Now is the time to investigate Aviation. Send for this beautifully illustrated book. It contains many facts about Aviation you never knew before... explains exactly how you can get into this Aviation game and prepare for big earnings in this new uncrowded field. If you are a live young man—if you're dissatisfied with a monotonous job — GET THE FACTS. Mail the coupon now for this free book.



Now Free



American School of Aviation,
Dept. 1355, 3601 S. Michigan
Ave., Chicago, Ill.

Yes! Rush me your free book "Opportunities in the Airplane Industry." Also information about your Home Study Course in Practical Aviation. This does not obligate me.

Name..... Age.....

Address.....

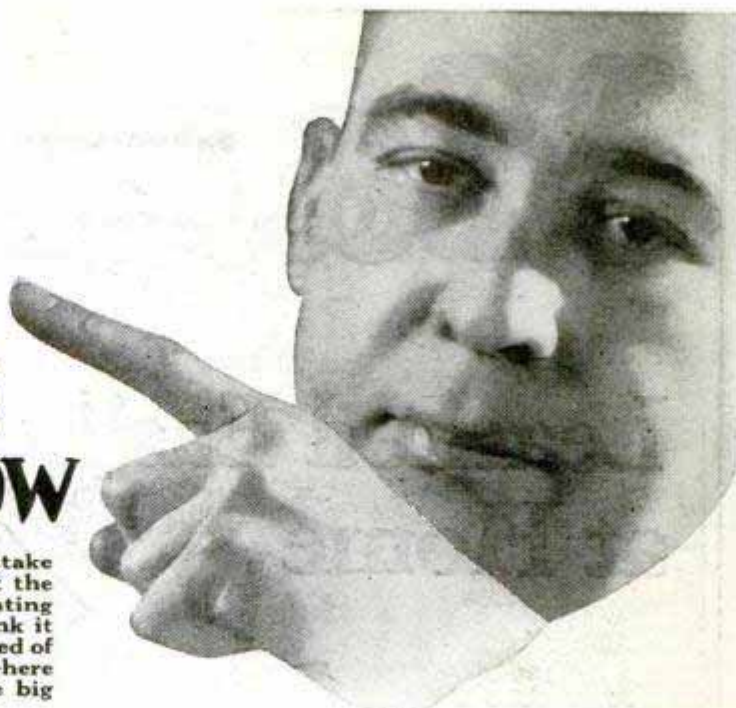
City..... State.....

American School of Aviation
Dept. 1355, 3601 S. Michigan Ave., Chicago, Ill.



IF YOU WERE FIRED TOMORROW

If the boss came down with a grouch—or you made a mistake—And You GOT FIRED, could you get another job at the same pay right away? Or would you have to go job-hunting like any ordinary untrained man who gets fired? Think it over! If you are tired of being a cog in a machine—or tired of working in an uncertain, 2x4-inch job with no future—here is a real opportunity! Read about it—it may be the big turning point of your whole career!



Stop Gambling With Your Future and LEARN ELECTRICITY

WHERE JOBS HUNT MEN AT \$50 A WEEK AND UP

LET me make you a real money-maker. Let me take you out of the "hired-help" class—and start you on the road to real success, in 90 days. Make up your mind to say good-bye forever to precarious, tiresome, routine jobs—crabby bosses—and low pay that can never be more than \$35 or \$40 a week! You don't need to tolerate them any longer!

Amazing Opportunity

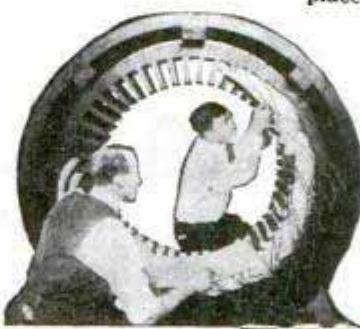
Electricity is calling for trained men—and Coyne 12-week graduates are among the preferred class. Many of them have stepped out of our doors into wonderful jobs paying from \$50 and up to \$200 a week! And our free employment bureau helps to secure positions for others.

Learn Without Lessons

Electricity is surprisingly easy to learn this practical way *without* books or dry lessons. That's the secret of Coyne training. All training consists of *ACTUAL* and *PRAC-TICAL* work on fine big electrical equipment—dynamos, transformers, etc. (Real ones—not models). You learn by *doing*—and experts work right with you every step of the way.

I PAY YOUR R. R. FARE

Right now I am making a special offer to pay any man's railroad fare to Chicago from any point in the U. S., upon enrollment. Send coupon for details.



COYNE H. C. Lewis, President, Dept. 57-72
ELECTRICAL SCHOOL 1300-10 W. Harrison St.
CHICAGO, ILL.

No Experience or Education Needed!

Practically any man can master the "ins-and-outs" of Electricity—as taught in the Great Shops of Coyne. You don't need one bit of previous experience or any more than common-school education. Any number of our highly successful graduates never completed eighth grade.

2 Extra Courses FREE

If you act now—I'll not only pay your railroad fare to Chicago—but I'll give you two big, extra courses absolutely without charge—**RADIO and AUTOMOTIVE ELECTRICITY**. Furthermore, I'll help you to locate a *part-time job while learning!* FREE employment service after graduation, too. We help place men in wonderful jobs every week!

Send for FREE Book

Just give me a chance to tell you about the wonderful things that Electricity has in store for you after 12 happy weeks at COYNE. Send the coupon for my free, illustrated book containing over 150 photographs and details of my special offer. No obligation. Mail it today!

BIG BOOK FREE

Coyne Electrical School,
H. C. Lewis, Pres., Dept. 57-72,
1300-10 W. Harrison St., Chicago, Ill.

Dear Mr. Lewis:

Without obligation, send me your free illustrated catalog and details of your R. R. Fare offer.

Name.....

Address.....

City.....State.....

Magic

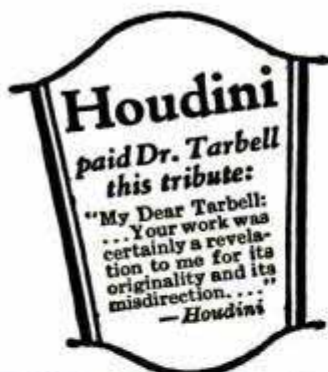
Learned Easily
at Home

Astonish
Your Friends



Dr. Harlan Tarbell, internationally known magician and teacher of some of the world's greatest magicians.

Gain the magnetic popularity that makes you the center of any crowd. Business and social success is assured the man who can perform mystifying tricks. You can earn big money on the side or as a professional, as well as being the most popular person in your crowd. Why envy others' skill? You can learn Magic yourself, quickly and easily.



**Earn \$250 to
\$1000 a Month**

even sleight of hand, generally supposed to require long practice, is NOW made simple to learn. For Dr. Harlan Tarbell, one of the really Great Magicians, has finally opened up the secrets of his profession in a completely illustrated course offered at a merely nominal cost. Through the wonderful Tar-

bell system you will be able to mystify and entertain your friends. After that Dr. Harlan Tarbell takes you through the entire maze of sleight of hand, card tricks and elaborate stage diversions. The apparently superhuman doings of the accomplished magician becomes as simple as ABC.

Salesmen!
Write me today.
Learn how my

**Course
in Magic**

will absolutely
help you increase
your earning
power.

Mail This Coupon NOW!

Tarbell System, Inc., Studio 13-55
1920 Sunnyside Avenue, Chicago, Illinois

Gentlemen: Without any obligation send me your free literature and information all about your wonderful "Tarbell Course in Magic." Also tell me about your great Special Price Offer and Easy Payment Plan—offered NOW for limited time only.

Name.....

Address.....

Age.....

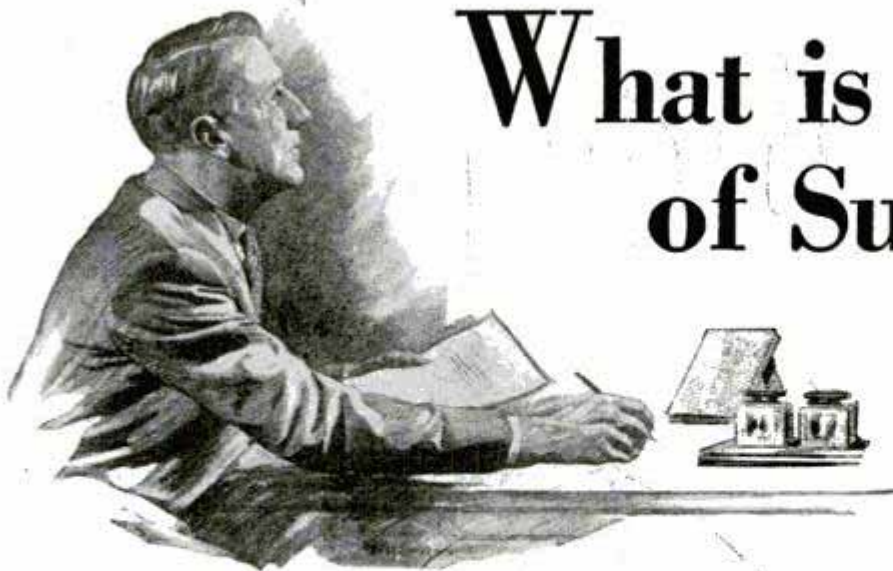
Great Special Offer!

There is a tremendous demand for magic entertainment. Clubs, Lodges, Charity and Social affairs—all will pay high fees to the man who knows Magic. Dr. Harlan Tarbell really gets as high as \$250 for a half hour's work right now. Opportunity everywhere to make money aside from your regular occupation. Salesmen find it a tremendous asset. Find out all about this unprecedented opportunity to learn Magic. Learn about the great Special Price and Easy Payment Offer we are making Now, for a limited time only. The coupon brings full details without any obligation. *Mail it TODAY.*

Tarbell System, Inc.

1920 Sunnyside Ave., Studio 13-55 Chicago, Ill.

What is your idea of Success?



SUCCESS means something different to each one of us. To some it means a million dollars. To others it means \$5,000 a year and a comfortable home.

What does it mean to you?

We don't know the answer to this question. But we do know this. If you should make a list of the things you must have before you can consider yourself successful, you would find that most of them depend on *money*.

"That's pretty materialistic," you may say. "Money won't buy happiness, or friendship." True. But money *will* buy the time to be happy, the *opportunities* for friendship. Money *will* buy a home; money *will* educate your children.

What are you doing to earn more money? You are probably in business, or want to be. The language of business is figures. Do you know the language? The untrained man, no matter how great his natural ability, is a drug on the market. The world's

biggest rewards go to the men who *know*.

What are you doing to learn more? Why not start *now* to get the big things?

You can. There is a tried and proved method of increasing your earning power.

The Key to Profit —ACCOUNTING!

For years the opportunity in Accounting has been wonderful. Said the conservative *Journal of Accountancy*: "The Accounting profession is probably the best paid in the world . . . There is need of accountants. There is ample compensation for accountants. There is no prospect that the supply will overtake the demand within the lifetime of even the youngest of us."

Fortunately Accounting, besides being profitable, is a *fascinating* profession. The accountant is the trusted adviser of the biggest business men. He has a bird's-eye view of the whole business. Because he is at the throttle of profit control, he is always in the confidence of the owners.

"But," you say, "Accounting is a complicated profession. I am busy all day in my present job; I haven't time to learn it."

Now the International Accountants Society has solved that problem. In only a few minutes a day, and at moderate expense, you can learn Accounting.

This isn't a mere promise; it is not a new or experimental scheme. The International Accountants Society was organized in 1903. It is conducted by a group of prominent Certified Public Accountants. Its successful graduates are numbered in the thousands. Writes one of them (Mr. W. E. Stoudt, Plant Accountant for the American Thermos Bottle Co., Norwich, Conn.):

"It has enabled me to double my income in two years, and has opened up to me many new jobs which I never could have filled without Accounting knowledge."

And Mr. J. E. Mayer, Certified Public Accountant of Portland, Oregon, says:

"I enrolled with the International Accountants Society in January, 1923. In February, 1924, I received my diploma from you. I was granted my C. P. A. certificate from the Oregon State Board of Accountancy in March, 1925. Naturally, my income has been materially increased."

In an announcement like this we cannot hope to tell the whole story. But we have published an interesting 80-page book that *does* tell. It gives all the facts about the great and growing profession of Accounting; it tells how you can qualify, easily, quickly, inexpensively, and without interfering with your present work.

There's no obligation; the book is absolutely free. Don't put it off—send for your copy today.

INTERNATIONAL ACCOUNTANTS SOCIETY, INC.

Since January 1, 1927, a Division of the
ALEXANDER HAMILTON INSTITUTE

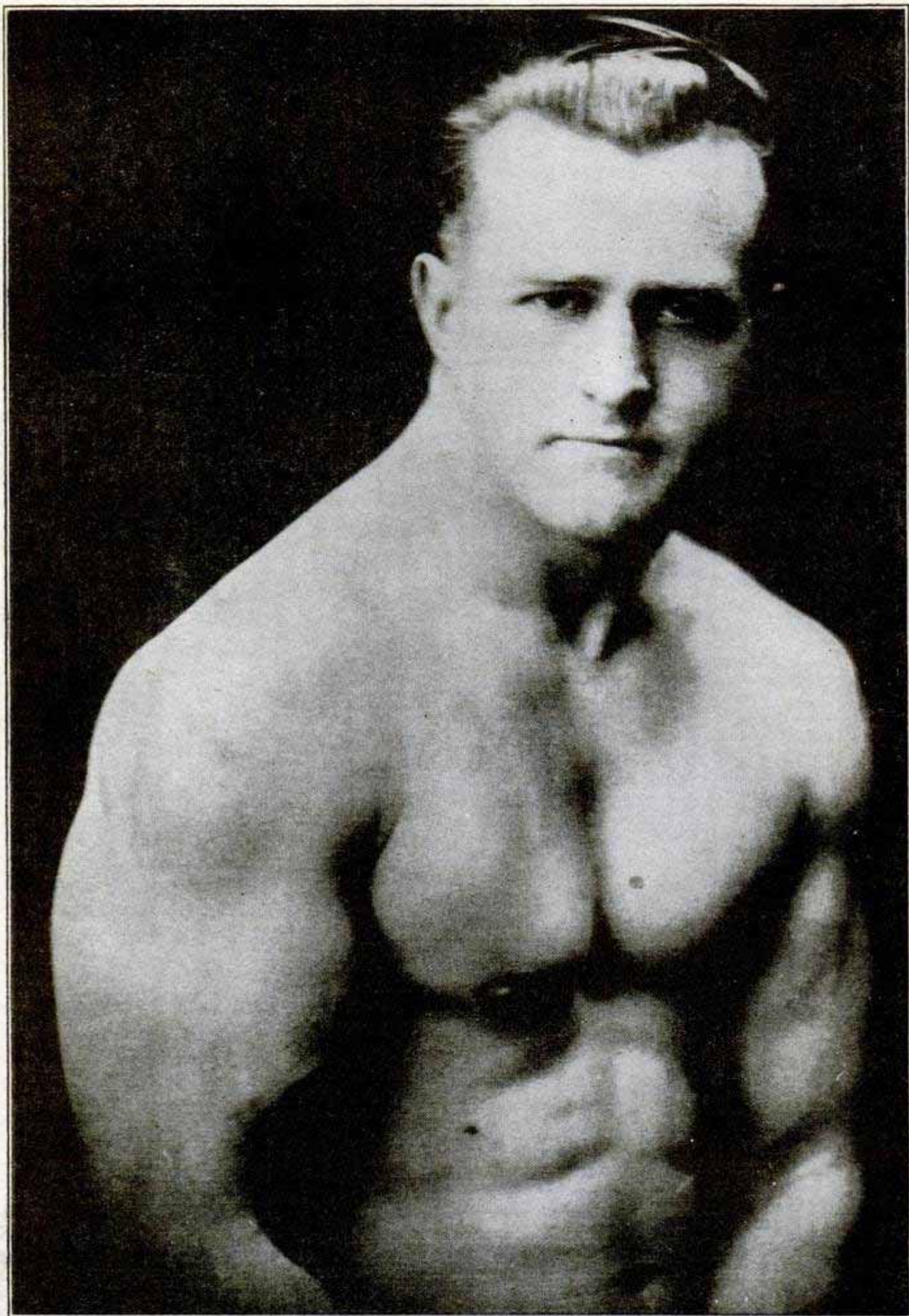
TO THE INTERNATIONAL ACCOUNTANTS SOCIETY, INC.
3411 South Michigan Avenue, Chicago, Illinois.

Send me, free, "HOW TO LEARN ACCOUNTING," and tell me how I can increase my income as your other students have done.

Name..... Business Position.....

(Please write plainly)

Street..... City..... State..... 111



EARLE E. LIEDERMAN, *The Muscle Builder*
Author of "Science of Wrestling," "Muscle Building," "Secrets of Strength," "Here's Health," "Endurance," etc.

Over 100,000 Have It— Did You Get It?

My men have it—every single fellow who has placed himself under my wing now has muscles, strength and health. I did this big everlasting job for over 100,000 men all over the world. Yes, I have taken fellows in every walk of life and developed them from weaklings into muscular marvels. The vast number of prize winners whom I have developed alone stands out and speaks for my record. It takes more than a strong man to tell men how to develop muscles—it takes a man who has made a life study of muscle building—he is the only man who absolutely takes the guess and risk out of getting strong and gives you the real know-how. Your body is your prize possession—nothing is too good for it. Fortify that body of yours with strong sinewy muscles like the old village blacksmith had. Make up your mind to be strong! I will show you how to be strong so that you can add many years to your life. Don't take chances by dissipating or by neglecting your health.

I claim that strong men are made and not born—that's why they call me The Muscle Builder. I will make you strong if you will only make up your mind that I can do it. I have taken physical wrecks and in less than ninety days' time developed them into muscular marvels—yes, a number of them won prizes as being perfect specimens of manhood.

I WORK FAST

Right off the bat I take that old bony body of yours and begin rebuilding it. The first thirty days I put one solid inch of muscle on your arm and two inches on your chest during the same period of time. I work with you ninety days in all, and before I am through with you, you'll be the picture of health. I don't care what you look like now. I know that after I give you my stuff you'll be muscles from head to foot—you won't only be strong outside, but you will be strong inside. I make you over again so that you will just tingle with life. You will be able to tackle any of life's problems. You will without fear be able to enjoy any pleasures. You will be able to mix with men without fear of being called a sissy or being kidded about being a weakling. You will be there in every sense of the word and you will stay there. After you learn the secret of having muscles and health you will never again in your life worry about cashing in before your designated time.

I LIKE NERVOUS WRECKS

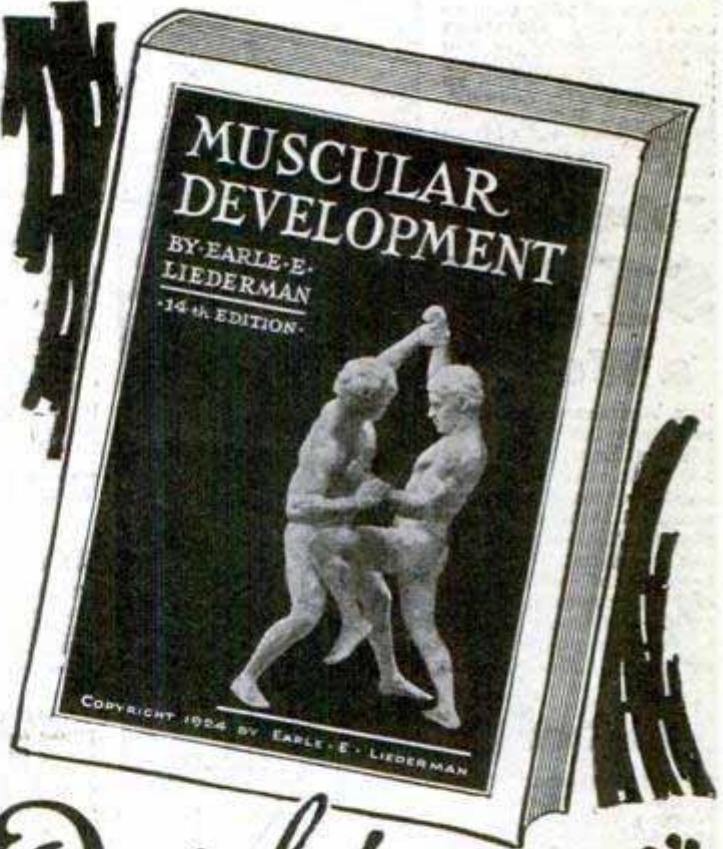
If you are the kind of a chap who is a nervous wreck and afraid of his own shadow, you are the kind of a fellow that I like to get—you're the kind of a fellow that I like to show my stuff to. My pupils have no fears. My men are internationally known as real he-men, and you, too, can be one of them.

HERE'S THE BIG MOMENT

The big moment of your life is before you now. You must decide whether you are going to go floundering around in life and take a chance that Father Time will get you any day. Don't pass up the opportunity that is before you, but get in touch with me and make me prove that I can make a muscular marvel out of you. I don't promise to do it, I guarantee it. I will give you the know-how of muscle and health getting, and give you all of my personal secrets, so that your future life will always be a strong, healthy and happy one.

TIME WAITS FOR NO MAN

Don't put off till tomorrow what you can do today. Delay is the most dangerous habit of man. Make up your mind this very minute that you are going to be healthy; that you are going to have a world of strength. It doesn't cost you a single cent to find out how I work and to see what I have done for others. I want you to make me prove that I am the Muscle Builder, and that I can build muscles, strength, vitality and robust health for you.



Send For My New
64 Page Book

"Muscular Development"

IT IS FREE

It's a wow—I want you to have it with my compliments. No obligations. Just read it. It will inspire you. It will thrill you. It's the best half-hour's reading you ever had. Contains forty-eight full-page photographs of myself and some of my prize-winning pupils I have trained. See what I've done for every kind of a man you can think of. Doctors, lawyers, merchants, mechanics, etc. Read how I make weak men strong, strong men stronger. Look over the art gallery. You'll never give it away. I swear you won't. No strings attached to it. Here's your chance for a free ride. Don't hesitate. Do it now before you forget. Take out your pen or pencil—fill in your name and address and shoot it to the mail box.

EARLE E. LIEDERMAN
Dept. 2005, 305 Broadway, New York City

It
Is
F
R
E
E

DON'T
SEND ONE
PENNY

YOUR
NAME AND
ADDRESS
ON A
POSTAL
WILL DO

EARLE E. LIEDERMAN,
Dept. 2005, 305 Broadway,
New York City.

Dear Sir: Without any obligation on my part whatever please send me a copy of your latest book, "Muscular Development."

Name.....

Address.....

City..... State.....

(Please write or print plainly.)



Easiest, pleasantest work you ever saw! Your own boss, money and success yours from the very beginning. You can start with a "shoe-string." We prepare you in a few months to run a business of your own, to do any job. Common schooling, ability to use your fingers **ALL YOU NEED! R. R. Fare to Chicago, Cleveland, Detroit, Boston or Philadelphia deducted from cost of course for a limited time!**

Jobs Up to \$125 a Week!

In a business where there are many times as many jobs as Experts, salaries are high, hours are easy, opportunities are everywhere! Dentists recognize the high-standing of our graduates. No books here—learn with tools and instruments. Start quick—get ready in a few months for your big opportunity! *Mail Coupon today!*

Rubber Plates

Learn to make partial upper or lower plates with soldered, cast or wire clasps, with palatal bars; with lingual bars. McCarrie-trained Students learn to make full rubber plates of every type, including Vulcanite base-plates, butted gums, carved gums, etc.

CROWNS

Here's only a small part of your practical training in Crown-work: Two-piece, seamless, open-face, Richmond, cast-base porcelain, Carmichael, split-pin, carved (swaged) cusp, cast cusp, etc.

BRIDGE WORK

Complete training in both fixed and removable bridgework. Interchangeable teeth, gold dummy, Sanitary porcelain dummy jobs—Roach, Gilmore, Bischoff and all forms of cast-clasp work is taught—not with books but in *actual Laboratory*.

METAL BASE DENTURES

Cast bases of Aluminum, Watt's metal, etc., are included in your training. Both centrifugal and air pressure casting machines are used. Free Book contains complete list of subjects in course.



R-R-FARE TO Chicago Cleveland Detroit Boston or Phila. DEDUCTED from TUITION

This Dental Laboratory Expert earns UP TO \$20 a day!

What's the use of training for the old, overcrowded trades? If you're going to prepare for big-salaried jobs or a profitable business of your own **GET INTO THE FASTEST GROWING PROFESSION—"Laboratory Dentistry."** Biggest opportunity for success of the century, because there are many more jobs than there are experts to fill them, because there are a dozen cities crying for Laboratories for each **EXPERT** capable of operating one!

64,000 DENTISTS NEED LABORATORY WORK!

Only a few hundred Laboratories in all the U. S.—most of them in the larger cities. Dentists can't afford to do their own mechanical jobs. They can buy the services of a Laboratory Expert at about \$3.00 an hour and sell their own time at \$6 to \$15 an hour. Dentists will encourage you to learn mechanical Dentistry, start a "Lab" of your own, give them quicker service than sending their work to other cities. Dentists can't wait and keep their patients waiting. Ask your Dentist.

WE HELP YOU OPEN A LABORATORY OF YOUR OWN!

Many of our graduates open a Laboratory of their own. To encourage more men to go into this wonderful Mechanical profession, we will help you find a good location for your Laboratory, and help you towards success. Write for complete information on how you can find yourself in a profitable business of your own after you become a Dental Laboratory Expert.

INTERESTING BOOK—FREE!

Right this minute there are openings for 150 Dental Laboratory Experts in locations where they can do a business of \$5,000 to \$20,000 a year. But you can't cash in, take advantage of these OPPORTUNITIES until you're *Trained*. Catalog tells you how quickly and easily you can get ready, how hundreds of others have **SUCCEEDED!** Tells you how you learn in a few months **BY DOING ACTUAL LABORATORY JOBS** in our famous *Dental Laboratory Schools*. Brings you **R. R. Fare** offer and other big inducements. *Write for free Book today!*

EARN while you LEARN!

Day students make all or part cost of course by part-time night work. Night students can find plenty of good jobs to see them thru. We'll help you!

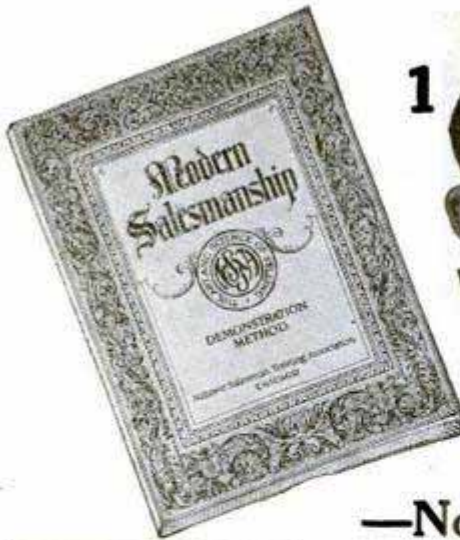
McCarrie School of Mechanical Dentistry

1338 S. Michigan Ave.
Dept. 114 Chicago, Ill.

McCarrie School of Mechanical Dentistry
1338 S. Michigan Ave., Dept. 114, Chicago, Ill.

Without obligation, please send me your *R. R. fare* offer and free Book with complete information about how I may become a Mechanical Dentist. How you will help me open a Laboratory, how you will help me find a job while I take my training, etc.

Name.....
St. No. or R. F. D.....
City.....State.....



—Now
FREE

Englehardt \$4,800
Harelsion \$20,940
Rowland \$2,500
Jacobsen \$5,200
Widmer \$2,500
\$35,940
Average...\$7,188

Raised These 5 Men's Pay \$35,940

Now—For A Limited Time Only—This Remarkable
Man-Building, Salary-Raising Volume Will Be Mailed
FREE To Every Ambitious Man. If You Ever Aspire
To Earn REAL Money—Read It Without Fail!

Where Shall We Send Your Copy—FREE!

A BOOK! Just seven ounces of paper and printer's ink—but it contains the most vivid and inspiring message that has led hundreds of ambitious men to the success beyond their fondest expectations! So powerful and far reaching has been the influence of this little volume, that a famous business genius has called it "The Most Amazing Book Ever Printed."

This vital book—"Modern Salesmanship"—contains hundreds of surprising and little-known facts about the highest paid profession in the world. It reveals the real truth about the art of selling. It blasts dozens of old theories, explains the science of selling in simple terms, and tells exactly how the great sales records of nationally-known star salesmen are achieved. And not only that—it outlines a simple plan that will enable almost any man to master scientific salesmanship without spending years on the road—without losing a day or dollar from his present position.

A Few Weeks—Then Bigger Pay

There was nothing "different" about these men whose letters you will find on this page when they started. Any man of average intelligence can duplicate the success they have achieved—for their experience proves that salesmen are made—not born, as some people have foolishly believed.

Salesmanship is just like any other profession. It has certain fundamental rules and laws—laws that you can master as easily as you learned the alphabet. And through the National Demonstration Method—you can acquire the equivalent of actual experience while studying.

Demand for Trained Salesmen

City and traveling positions are open in hundreds of lines all over the North American continent. For years, thousands of leading wholesalers, jobbers and manufacturers have called on the Association to supply them with salesmen. Employment service is free to both employers and members.

Free to Every Man

If we were asking several dollars a copy for "Modern Salesmanship" you might hesitate. But it is now FREE. We cannot urge you too strongly to take advantage of this opportunity. No matter what your opinion is now, "Modern Salesmanship" will give you a new insight into this fascinating and highly-paid profession. Mail the coupon now!



Dept. E-12, N. S. T. A. Bldg., Chicago, Ill.

National Salesmen's Training Assn.

Dept. E-12, N. S. T. A. Bldg., Chicago, Ill.

Without cost or obligation you may send me your free book, "Modern Salesmanship."

Name.....

Address.....

City.....State.....

Age.....Occupation.....

1 \$5,200 Increase
"When I took up your course, I was earning \$35 per week. Now I am earning on an average of \$135 a week. Probably to a stranger it would sound like a fairytale, but it's absolutely true. My wife and I attribute this remarkable progress in large part to N. S. T. A. training."
J. L. Jacobsen,
Minneapolis, Minn.

2 \$20,940 Increase
"At the time of enrollment for N. S. T. A. training, I was working as a grocery clerk for the paltry sum of \$30 a week. My first year as a salesman paid me better than \$5,000, my second year was better than \$7,500 and the third year paid me \$22,500! I know that without N. S. T. A. I would still be a clerk at \$30." V. H. Harelsion,
Miami, Fla.

3 \$2,500 Increase
"I recommend the N. S. T. A. course to all that can stand unusual prosperity. Since enrollment, my salary has increased over 250 percent to 300 percent."
H. E. Widmer,
Paterson, N. J.

4 \$2,500 Increase
"To any man who wishes to benefit himself, I would say: 'Take the course with the N. S. T. A.!' My work as a pattern maker gave me only a stipulated wage—while now earnings amount to almost 3 times as much—or about \$4,000!"
Kingsley Rowland,
Audubon, N. J.

5 \$4,800 Increase
"It is a privilege to tell of the many good things I have received from studying the N. S. T. A. course. After graduation, your employment department offered me choice of representing 48 firms (some service!). Last year I made over \$100 a week and expect to make \$7,000 this year. Some increase since my enrollment!"
F. B. Englehardt,
Chattanooga, Tenn.



"How I got the job that 34 others were seeking"

THIRTY-FIVE men applied for the position as Advertising Manager of a big department store in New Orleans. But Sam D. Reeks was selected above all these other men because he was trained.

He says: "My I. C. S. course enabled me to put my facts before the proprietor of this business in such a way as to prove that I knew what I was talking about. I was just as well equipped to discuss his advertising with him as if I had been at the work for years and years."

Mr. Reeks was given the position—and he made good in a big way after he got it—because his International Correspondence Schools course had prepared him to take advantage of his Opportunity when it came. Just a few years ago he was elected president of the Advertising Club of New Orleans—another tribute to his personality and ability.

Why don't you study, as Mr. Reeks did, and prepare to get a better position and a larger salary? You can do it if you really try.

At least make the start by marking and mailing the coupon printed below and find out what the I. C. S. can do for you. It doesn't cost you a penny or obligate you in any way to get the facts, but that one simple little request may be the means of changing your whole life. "Do it now."

Mail the Coupon for Free Booklet

INTERNATIONAL CORRESPONDENCE SCHOOLS Box 5649-E, Scranton, Penna.

Without cost or obligation, please send me a copy of your booklet, "Who Wins and Why," and full particulars about the course before which I have marked X in the list below:

BUSINESS TRAINING COURSES

- | | |
|--|---|
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Industrial Management | <input type="checkbox"/> Advertising |
| <input type="checkbox"/> Personnel Organization | <input type="checkbox"/> Better Letters |
| <input type="checkbox"/> Traffic Management | <input type="checkbox"/> Show Card Lettering |
| <input type="checkbox"/> Business Law | <input type="checkbox"/> Stenography and Typing |
| <input type="checkbox"/> Banking and Banking Law | <input type="checkbox"/> English |
| <input type="checkbox"/> Accountancy (including C.P.A.) | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Nicholson Cost Accounting | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Common School Subjects |
| <input type="checkbox"/> Private Secretary | <input type="checkbox"/> High School Subjects |
| <input type="checkbox"/> Spanish <input type="checkbox"/> French | <input type="checkbox"/> Illustrating <input type="checkbox"/> Cartooning |

TECHNICAL AND INDUSTRIAL COURSES

- | | |
|---|--|
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Architect |
| <input type="checkbox"/> Electric Lighting | <input type="checkbox"/> Architects' Blueprints |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Contractor and Builder |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Architectural Draftsman |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Concrete Builder |
| <input type="checkbox"/> Railroad Positions | <input type="checkbox"/> Structural Engineer |
| <input type="checkbox"/> Gas Engine Operating | <input type="checkbox"/> Chemistry <input type="checkbox"/> Pharmacy |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Automobile Work |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Airplane Engines |
| <input type="checkbox"/> Metallurgy <input type="checkbox"/> Mining | <input type="checkbox"/> Agriculture <input type="checkbox"/> Navigation |
| <input type="checkbox"/> Steam Engineering | <input type="checkbox"/> Mathematics <input type="checkbox"/> Radio |

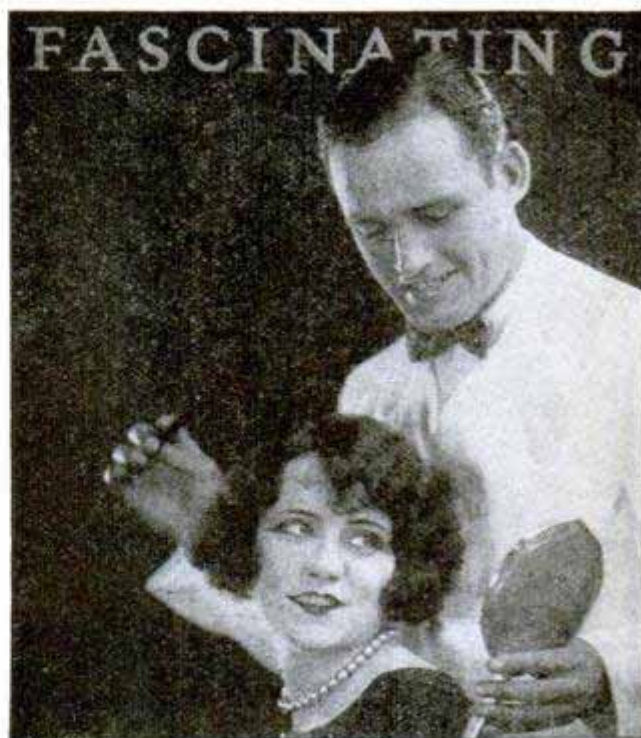
Name.....

Street Address.....

City..... State.....

Occupation.....

Persons residing in Canada should send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada



Ladies' Patronage has made **BARBERING** one of the splendid paying professions of the day. 60,000 **MOLER GRADUATES** know **MODERN BARBERING IS EASY TO LEARN—QUICK TO EARN—CLEAN** and **FASCINATING**. Write for catalog B-5.

Address the Branch
of the **MOLER SYSTEM OF COLLEGES** nearest you.
(Street address not needed)

Chicago, Ill.	Detroit, Mich.	Atlanta, Ga.
New York, N. Y.	Denver, Colo.	
St. Louis, Mo.	New Orleans, La.	Memphis, Tenn.
Kansas City, Mo.	Dallas, Tex.	
Cincinnati, Ohio	Omaha, Nebr.	Houston, Tex.
Cleveland, Ohio	Milwaukee, Wis.	San Antonio, Tex.

Learn Watchwork, Jewelrywork and Engraving A fine trade commanding a good salary, and your services always in demand. Address **Horological**, Dept. P, Bradley Institute, PEORIA, ILLINOIS, for our latest catalog.



PLAY PIANO BY EAR

Master Jazz or Ragtime in 90 days by famous Niagara Method. 35,000 pupils. Big, established school. Certificate given on graduation. Send dime Today for booklets: "Entertaining at Piano" and "The Niagara Secret" Niagara School of Music, Dept. 132, Niagara Falls, N.Y.

STAMMER

Write for my free book "Millard's Advanced Natural Corrective Course" and a free copy of my speech magazine. 10,000 cases successfully treated. Est. 24 years. Largest school for stammerers in world. Millard Inst. of Normal Speech, 2317 Millard Bldg., Milwaukee, Wis.

Learn to PAINT Signs and SHOW CARDS
We quickly teach you by mail, or at school, in spare time. Enormous demand. Big future. Interesting work. Oldest, foremost school.
EARN \$50 TO \$200 WEEKLY
John Vassos, N. Y., gets \$25 for single show card. Crawford, B. C., says: "Earned \$200 while taking course". Send today for free information, samples and guarantee.
DETROIT SCHOOL OF LETTERING
154 Stinson Ave. Est. 1899 Detroit, Mich.



How Many of you men- can say "YES" to these questions?



**\$900
While
Studying**

While taking the Course I did repairing and installing and in that way made approximately \$900, thus paying for my course many times over. The N. R. I. way sure is the right way.
D. H. SUITT
Newport, Ark.

Does your work give you a chance to make money in spare time at the rate of \$1.50 to \$2.50 an hour?

Are you satisfied with your work, progress and pay?

Are you headed straight for a big future, instead of a "blind alley"?

Are you in pleasant surroundings—recognized as a professional expert?

Is your field NEW, uncrowded, full of wonderful opportunities?

Have you a chance to become your own boss; to get into business for yourself?

Are you paid for what you say—for expert advice—as well as for what you do?

If you lost your job could you quickly step into any one of a dozen other well-paid positions?

Are there chances for world travel as Big Pay in your field?

Are big corporations right now bidding against one another for your services?

If you CAN'T say "yes" You need this BOOK

I'LL PROVE that YOU can say "YES" to every one of those questions! I'll fit you quickly at home for a big position in RADIO—the \$400,000,000 Industry that has boomed too fast for the few that are in it. There's a famine of Trained Radio Men. Jobs are begging for the man who can say "I know—I can." Men with even a little Radio knowledge are eagerly snapped up by manufacturers, broadcasters, steamship companies, stores, laboratories. Others make BIG MONEY in business for themselves. Look at the Broadcaster—right in the thick of important work, meeting the famous people daily, talking to millions himself—and being PAID BIG for it! Look at the Radio Man aboard ship—seeing the world with expenses paid, officer's privileges, his own cabin and REAL PAY. Look at the Radio Research Man, working close to discoveries that will make millionaires. Man, here's where YOU belong! Here's the boundless opportunity my book "Rich Rewards in Radio" opens up for you. Here's where hundreds of N. R. I. Home-Trained Men today are the BOSSES—getting \$50, \$75, \$100 a week and up—and striding along to Big Futures. You can do what they have done. You can harness this same, sure, time-tested training to BIG PAY—QUICK CASH EVEN WHILE LEARNING—just as they are doing. Don't lose a minute. Get this coupon into the next mail!



I Train YOU at Home

**Radio
Needs
Trained
Men**

Since 1914 I've trained men for the Big Jobs of Radio—in this country, in Europe, sailing the seven seas. You don't need previous training or experience. I don't want you to give up your job, or study all night long. I want a little of your spare time, that's all. Furthermore, I'll give

you pointers for QUICK CASH right from the start. Many of my students actually make \$1.50 to \$2.50 an hour, in spare time, before they've even finished one-fourth of my Course! You can put my training into practice—CASH PRACTICE—right away. I give you 6 outfits of Radio Parts; you learn 100 Circuits. I give you expert Consultation Service, and a Diploma that's your passport to Radio recognition and employment. My result-getting Employment Department works for you. I'LL FIT YOU FOR RADIO—but I can't start until you send me this Coupon. If a thousand-dollar-bill was printed on it—you'd clip it! Well, there's more than a thousand there for YOU—and a two-cent stamp starts turning it into currency. SO—BE QUICK. Clip the Coupon—Mail it NOW!

National Radio Institute
Dept. E-85—Washington, D. C.

Originators of Radio Home-Study Training

What I mean by "QUICK"

I mean QUICK MONEY. Practical training that you can turn into CASH before the tenth lesson. I mean a Course that puts a \$1.50 to \$2.50 an hour price-tag on your spare time—long before you graduate. I mean I put you in the class with hundreds like: Luce of Pennsylvania, \$320 in 7 weeks spare time; Auchampaugh of Illinois, made \$500 extra while taking course. J. E. SMITH

J. E. SMITH
President

**I'll send it
FREE
to Ambitious Men
Who Mail This
Coupon**

Now

J. E. SMITH, President, National Radio Institute,
Department E-85, Washington, D. C.

Dear Mr. Smith: Without obligation send me my FREE copy of "Rich Rewards in Radio," telling how you train me for QUICK spare time MONEY and a Big Future in Radio. It is understood my dealings will all be with you personally, and that no salesman will call on me.

Name.....Age.....

Street.....

City.....State.....



Earn Big Money as a Cartoonist!

Millions of dollars were spent last year on comic strips, political and sport cartoons, animated cartoons, etc. Scores of new cartoonists are needed now to meet the ever-increasing demand for this work. Never before have the opportunities in this fast-growing field been so many, so varied or so high-paying.

Easy Now to Learn CARTOONING at Home

Regardless of how little you know about cartooning now, you can easily be qualified for a position in this attractive, high-salaried business. This home-study method starts you at the simplest fundamental principles of cartoon-making and takes you through every branch of humorous and serious cartooning.

You will be amazed at how quickly it teaches you to draw salable work. Many students of this method began to sell their drawings before they were half through their courses. The training paid for itself long before they finished it.

Learn cartooning this easy way. Enjoy the fascinating life of a successful cartoonist—easy hours, freedom from routine, your own boss, and \$3,000 to \$15,000 a year for this work that is play!

Send for FREE BOOK

Learn more about the wonderful opportunities in cartooning, and details about this remarkable home-study method. A handsomely illustrated booklet has just been prepared which, upon request, will be sent to you without the slightest obligation. This booklet gives a thorough outline of the cartooning field, and explains in detail this wonderful method of teaching Cartooning. Send for it today! Washington School of Cartooning, Room 305-E, 1113-15th St., N. W., Washington, D. C.



Washington School of Cartooning
Room 305-E, 1113-15th St., N. W., Washington, D. C.

Please send me, without obligation, your Free Booklet on Cartooning and full details of your home-study method of teaching Cartooning.

Name..... (Print Name Plainly)

Address.....

City..... State.....

(If under 16, please give age.....)

Learn to Write

I Teach by Mail

I CAN make a good penman of you at your home during spare time, no matter where you live or how poorly you now write. My simplified system has shown thousands of others the way to good penmanship during the past twenty years — it can and will do the same for YOU!

Beautifully Illustrated Book

"How to Become a Good Penman"

It contains general information, with testimonials and beautiful specimens of penmanship showing what others have accomplished by the Tambllyn System. (Your name elegantly written on a card if you enclose stamp for postage.) WRITE TODAY. Address

F. W. TAMBLYN
418 Ridge Bldg., Kansas City, Mo., U. S. A.

MUSIC LESSONS FREE



Write today for our FREE booklet. It tells how to learn to play Piano, Organ, Violin, Mandolin, Guitar, Banjo, etc. Beginners or advanced players. Your only expense about 2c per day for music and postage used. **American School of Music**, 51 Manhattan Bldg., Chicago

Learn Advertising at HOME

Many of the highest paid men in the world are advertising men. You can learn easily and quickly at home during your spare time. We guarantee satisfaction. Bigger opportunities now in advertising than ever before. Constant demand for our graduates at splendid pay.

Send for FREE Book. Giving interesting information and vital facts—just what you want to know about advertising. Write today.

Dept. 1355 **PAGE-DAVIS SCHOOL OF ADVERTISING**
3601 S. Michigan Ave., Chicago, U. S. A.

FOREST RANGERS

Men wanting forest ranger, mail clerk, or other government positions, write for particulars.

MOKANE, 236, DENVER, COLO.



200 Kinds of **IRON, WOOD** and **WIRE PUZZLES**. Leader and Illustrated List **10 cents**.
Western Puzzle Works, St. Paul, Minn.

LEARN WATCH REPAIRING

Be a watchmaker—you can learn this profitable trade by correspondence in a few weeks in your own home by the DeSelms Chart System. After you complete the course you will know a watch from A to Z. You will know just what the matter is and how to repair one. When you graduate you will be a practical watchmaker and repairer and competent to fill any position. Positions for our graduates. Ask for our Free Book. It explains our system and terms.

THE DeSELMS WATCH SCHOOL
LOGANSPOUT, INDIANA



BUILDERS

TRADE GUIDES

4
Vols.
\$6

AUDELS CARPENTERS AND BUILDERS GUIDES—4 VOLS. \$6

\$1
PER
MO.

Inside Information for Carpenters, Builders, Joiners, Building Mechanics—all Woodworkers. **1600 pages; 3700 diagrams; flexible; pocket size.** Short-cut instructions, new methods, ideas, solutions, plans, systems—money saving suggestions. An easy progressive course for the apprentice. A practical daily helper and Quick Reference for the master worker. A Helping Hand to Easier and Better Work and Better Pay. To get this aid for yourself, simply fill in and mail the FREE COUPON below.

INSIDE TRADE INFORMATION ON:

How to use steel square; How to file and set saws; How to build furniture; How to use mitre box; How to use chalk line; How to use rules; How to make joints; Carpenters' arithmetic; Mensuration problems; Estimat-

ing strength of timbers; How to set girders and sills; How to frame houses and roofs; How to estimate costs; How to build houses, barns, garages, bungalows, etc.; How to read and draw plans; Drawing up specifications; How

to excavate; How to use settings 12, 13 and 17 on the steel square; How to build hoists and scaffolds—skylights; How to build stairs; How to put on interior trim; How to hang doors; How to lay floors; How to paint.

"Audels Guides worth four times their price—handy too as I carry them in pocket for reference." W. J. Bates, Knoxville, Pa.

4
Vols.
\$6

AUDELS PLUMBERS AND STEAMFITTERS GUIDES—4 VOLS. \$6

\$1
PER
MO.

A new set—just out! A practical, illustrated, Reference Library and Study-Course for Master Plumbers, Journeymen and Apprentice Steamfitters, Gas Fitters and Helpers, Sheet Metal Workers, Draughtsmen, Master Builders, Engineers and all Building Trade Students. **1670 pages; 3642 diagrams; flexible; pocket size.** Guides explain all the principles, advances and short cuts of the Plumbing and Heating trade. Contains instructions on how to figure and estimate jobs. Use FREE COUPON below to examine, without obligation, this valuable work.

INSIDE TRADE INFORMATION ON:

Soldering, tinning. Joint wiping, bending, beating. Pipe—iron—steel, threading. Mathematics, tables, physics. Materials—iron, steel, copper, brass, lead, tin, antimony. Sheet metal—galvanized—plate. Sanita-

tion, syphonage, tanks. Drainage, sewage, purification. Fixtures—bath—kitchen. Pipe fittings, soil pipe, tools. Laying out work. Roughing. Screwed fittings, flanges, joints. Pipe bending, examples. Elbows. Heating, ven-

tilation, refrigeration. Water supply, mains, wells, tanks. Gas-fittings. Underwriters. Sheet metal work, problems, methods, brazing, heating, lead burning. Welding, various welds, methods. Blacksmithing, forges, tools.

"Audels Guides are practical, easy to understand, reliable. Cover the field in plain language." W. J. Arminger, Annapolis, Md.

4
Vols.
\$6

AUDELS MASONS AND BUILDERS GUIDES—4 VOLS. \$6

\$1
PER
MO.

A new, complete, illustrated trade reference library, for Bricklayers, Cement Workers, Plasterers, Tile Setters and Stone Masons, including a practical outline of Steel Construction. **1100 pages; 2067 diagrams; flexible; pocket size.** A practical Trade Assistant explaining modern methods of masonry construction. Easy to understand and apply. A reliable and authentic reference work and study-course for Master Journeyman and Young Mechanic. Use FREE COUPON below and find out for yourself, without obligation, whether this set will benefit you.

INSIDE TRADE INFORMATION ON:

Bricklaying, tools, materials; Brick designs, patterns, bonds; Setting frames and foundations; Mortars, scaffolds, estimating; Mortars and mortar mixing; The setting, mosaic, hollow tile; Straight edge test, trow-

eling; How to figure brick work; Safe loads, piers, chimneys; Boiler settings, anchors, fire stops; Labor tables; Concrete, forms; How to figure concrete work; Stucco—on old and new buildings; Plastering—wood lath—metal;

Plasterers' agreements; Plastering on various surfaces; Stonemasonry; Cutting, finishing, estimating stone; Derricks, rigging; Steel construction; Fire proof; How to read blue prints.

"Audels Masons Guides are the best books on the subject I have laid brick 12 years and am able to judge." H. A. Sonnett, Cortice, Pa.



PRACTICAL ELECTRICITY — 1 VOL. \$4

\$1
PER
MO.

Audels Handy Book of Practical Electricity is a simplified Ready Reference and Study Course in one pocket size, leather bound volume—for Engineers, Professional Electricians and Students. **1040 pages; 2600 diagrams; flexible red leather bound.** A reliable authority and handy helper for every electrical worker. Contains important and valuable wiring diagrams, calculations, machine sketches, helps on maintenance and repair. Use this FREE COUPON today and find out, without obligation, how this handy book will help you in your daily work.

Complete in one
handy, red leather
bound volume



INSIDE TRADE INFORMATION ON:

Electro-Therapeutics, X-Rays, Shocks, Welding, Brazing, Radio Hook-ups, Motion Pictures, Telephone, Telegraph, Cranes, Bells, Elevators, Pumps, Tools, Ship Drive, Railways, Vehicles, Automobile Electric Systems, Ignition, Generation, Lighting, Plant Management, Power Plans, Armature Winding, Repairing, A. C. Motors and Apparatus, D. C. Motors and Apparatus, Alternator Construction, Dynamos, Wiring Diagrams, Sign Flashers, Cable Splicing, Power Wiring, Outside Wiring, Switches, Lighting, Rectifiers, Converters, Transformers, Fuses, Circuit Breakers, Rheostats, Electro Plating, Electrolysis, Storage Batteries, Magnetism, Electrical Energy, Conductors, Insulators, Static, Dynamic, Radio Electricity, Applications, Ready Reference and Index Covering the entire field of Modern Electricity.

Learn More and You Will Earn More!

Know your job and you'll never be without one. The skilled man is always in demand. Knowledge is power. Learn your trade thoroughly by easy reading. This coupon is your opportunity for advancement and better pay. You risk nothing in sending for Audels Guides for free examination. Send it NOW!

FREE
EXAMINATION
COUPON

THEO. AUDEL & CO.,
65 W. 23 ST., NEW YORK CITY
Please mail me for free examination the books marked (x) below. If I find them satisfactory, I agree to mail \$1 in 7 days, on each set ordered, and to further mail \$1 monthly on each set until I have paid the purchase price.

☐ 4 CARPENTERS GUIDES \$6 ☐ 4 PLUMBERS GUIDES \$6

☐ 4 MASONS GUIDES \$6 ☐ 1 ELECTRICIANS HANDY BOOK \$4

NAME

ADDRESS

OCCUPATION

EMPLOYED BY..... 5T30



High School Course in Two Years!

You Want to Earn Big Money!

And you will not be satisfied unless you earn steady promotion. But are you prepared for the job ahead of you? Do you measure up to the standard that insures success? For a more responsible position a fairly good education is necessary. To write a sensible business letter, to prepare estimates, to figure cost and to compute interest, you must have a certain amount of preparation. All this you must be able to do before you will earn promotion. Many business houses hire no men whose general knowledge is not equal to a high school course. Why? Because big business refuses to burden itself with men who are barred from promotion by the lack of elementary education.

Can You Qualify for a Better Position

We have a plan whereby you can. We can give you a complete but simplified high school course in two years, giving you all the essentials that form the foundation of practical business. It will prepare you to hold your own where competition is keen and exacting. Do not doubt your ability, but make up your mind to it and you will soon have the requirements that will bring you success and big money. **YOU CAN DO IT.**

Let us show you how to get on the road to success. It will not cost you a single working hour. Write today. It costs you nothing but a stamp.

American School

Dept. H-574, Drexel Ave. and 58th St., Chicago

American School

Dept. H-574, Drexel Ave. and 58th St., Chicago

Send me full information on the subject checked and how you will help me win success.

- | | |
|-----------------------------|---------------------------|
|Architect |Business Law |
|Building Contractor |Lawyer |
|Automobile Engineer |Machine Shop Practice |
|Automobile Repairman |Mechanical Engineer |
|Civil Engineer |Shop Superintendent |
|Structural Engineer |Employment Manager |
|Business Manager |Steam Engineer |
|Cert. Public Accountant |Foremanship |
|Accountant and Auditor |Sanitary Engineer |
|Bookkeeper |Surveyor (& Mapping) |
|Draftsman and Designer |Telephone Engineer |
|Electrical Engineer |Telegraph Engineer |
|Electric Light & Power |High School Graduate |
|General Education |Wireless Radio |
|Vocational Guidance |Undecided |

Name.....

Address.....

PREPARE FOR AN ART CAREER

—thru the only school operated as a department of a large art organization. Commercial Artists trained the "Meyer Both Way" earn as high as \$10,000 per year. We today have hundreds of students who had previously studied art elsewhere. Why? Because your instruction is based upon our everyday experience in meeting the art needs of leading advertisers. Home study instruction. Write for illustrated book telling of the success of our students.

MEYER BOTH COMPANY

Michigan Ave. at 20th St., Dept. 16, Chicago, Ill.

OPPORTUNITIES IN Traffic Management

Become a Traffic Expert

The opportunities in traffic management are limited only by the boundaries of the business world. The trained traffic man is in demand by transportation systems and by industrial organizations.

Three Detroit Firms Pay Their Traffic Managers Over \$20,000 a Year

Prepare for this growing, profitable profession at home in your spare time under supervision of traffic experts. Low cost; easy terms. Thru the LaSalle Problem Method you learn by doing. Valuable 64-page booklet free.



This Book FREE!

Send for it NOW. LaSalle Extension University, Dept. 564-T Chicago

"STAMMERING Its Cause and Cure"

You can be quickly cured if you stammer. Send 10 cents, coin or stamps, for 288 page cloth bound book on Stammering and Stuttering. It tells how I cured myself after Stammering and Stuttering for 20 years. **BENJAMIN N. BOGUE** 6943 Bogue Building, 1147 N. Ill. St. Indianapolis

LEARN PIANO TUNING AT HOME

During your Spare Time and earn \$50 to \$100 a Week



Emmy, Long Beach, Cal., says, "never dreamed there was so much money in Piano Tuning. I earned \$265 in ten days." He is just one of many. Our TUNE-A-PHONE MAKES IT EASY. With it any one with ordinary hearing can acquire the knack quickly and accurately by our method. Send for FREE BOOK and GUARANTY PLAN.

BRYANT SCHOOL OF TUNING, 81 Bryant Building, AUGUSTA, MICH.

STAMMERERS

Learn to speak correctly, increase earning power! Our methods invariably successful. Booklet Free **SAMUEL A. ROBBINS, 419 Boylston St., Boston, Mass.**

LEARN WATCHMAKING

and become independent. We help you secure a position.

Easy to learn. Send for FREE CATALOG. ST. LOUIS WATCHMAKING SCHOOL. Dept. 5. ST. LOUIS, MO.



WHY NOT spend Spring, Summer and Fall gathering butterflies, insects? I buy hundreds of kinds for collections. Some worth \$1 to \$7 each. Simple outdoor work with my instructions, pictures, price-list. Send 10 cents (not stamps) for my illustrated Prospectus before sending butterflies.

MR. SINCLAIR, DEALER IN INSECTS, Dept. 6, Box 1424, San Diego, Calif.

Men Wanted

Get This New 74-
Page Book Today.
It's FREE. The First
Step to a Big Pay Job.

Garage	\$150 to \$400
Tractor	\$10 a day
Electrician	\$225
Mechanics	\$10 a day
Chauffeurs	\$90 to \$150
Truck Drivers	\$125
Tire	\$100 to \$200
Welder	\$140 to \$200
Battery	\$150 to \$200

You, Too, Can Have
Money in Bank
\$5,000 Home



The SWEENEY SCHOOL

with over 65,000 graduates, trains you in a good trade. What appeals to you? Auto repairing—bus line driving—garage—repair shop—tire shop—welding—radio broadcasting—auto painting? Write me today—GET THE FACTS—about wages—profits—opportunities and HOW THE SWEENEY SYSTEM is equipped to give you successful training. Auto Mechanics make \$50 to \$100 a week. Learning is easy by the Sweeney System of Practical Training. Use tools not books. Be an auto mechanic—driver—truck driver—repair man—tire man—demonstrator. Own your garage or repair shop. Run a welding and vulcanizing shop. You can learn these trades separately or in a combined course.

Sweeney System "Learn by Doing"

E. J. Sweeney

If you are mechanically inclined, if you like to work with tools, you will learn under the "SWEENEY SYSTEM" by actually doing the work on the most complete gas engine and electrical equipment. Over \$200,000 invested. \$50,000 Radio Station WHB. You'll get dirty and greasy, but you'll learn through the SWEENEY SYSTEM OF PRACTICAL TRAINING that fits you for the big pay jobs waiting for Sweeney Trained Men.

World's Greatest Business

In all my years of teaching with tools, not books, and of training men for high paid jobs, there has never been a time when it was so easy for the trained man to cash in immediately on his work. Over 20 million cars and trucks now running, and annually 4 million new cars poured into the market; good roads everywhere; bus lines, city and country; repair shops, garages, battery and tire stations needed; electrical workers, painters, welders, mechanics, drivers find openings at high pay every place with certainty of sure continued employment. The Automobile industry has taken the world by storm, and the man who knows his job need never worry about assured success. Coming to the Sweeney School means that in a few short weeks you learn from the ground up in the shortest time, at less expense, by proven methods, and under the best surroundings.

Will You Work for \$10 a Day?

A tremendous demand for welders has sprung up over the country, both in automotive lines and also in Oklahoma where they can't get pipe welders for love or money. These jobs pay \$10 up and the trade is easily and quickly learned. I have taken our welding department and enlarged it into a special course so if you want a GOOD TRADE QUICK and a sure fire big pay job, here's your chance. All practical work and when you've finished, jobs are hunting the men—particularly in the booming southwest.

LEARN A TRADE—
Sweeney
AUTOMOTIVE & ELECTRICAL SCHOOL
3731 SWEENEY BLDG. KANSAS CITY, MO.

Listen man: Do you want money? Do you want independence? Do you want a sure trade that pays \$50 a week up? Do you want to travel and see the world? How would you like a good driving job? Or a place in a repair shop? Or your own service, tire or battery station?

Here's a letter that shows what you can do. \$10,000 CASH says it is true and genuine. Why man—I can show you 500 or a thousand letters just as good. YOU may not have to go broke to pay for your training. But even if you do, what's the odds? See how well it paid Hawkins to go broke.

Dear E. J.: All I can say is I was broke when I left Kansas City—had only 25 cents over my ticket to Meridian; came here—went to work in the Dodge Service Station. Then in N. East Service Station—then opened up a service place of my own. Now moved in a larger place— $\frac{1}{4}$ block square. Keeping six mechanics busy. Just built a nice home over \$5000. Own my own car, and wife has hers—sedan. Owe no one, have a good stock on hand and money in the bank. I can honestly say—it was Sweeney's wonderful training that did it. Before I went to Sweeney's I worked in a dry goods store as clerk—drawing one of top salaries, \$22.50 a week. Now the expenses of my three kids in boarding school are more than the \$22.50 a week I used to make.

I am still with you in the air at night—using an eight tube set, Western Electric amplifier. A. J. Hawkins, Meridian, Miss.

COME RIGHT NOW

Never Before Have I Made Such an Amazing Offer. I now make it possible for you to come to this Million Dollar Sweeney School Right Now.

FREE CATALOG AND SPECIAL OFFER



Get my big FREE 74-page catalog. It shows hundreds of actual photographs of men at work in my magnificent new school. Tells all about wages, profits, opportunities in auto business. Explains step by step how you learn. Interesting letters from graduates telling how they made good. Shows how men come from all over the world to this big school. Makes you want to join the crowd. Tells everything you want to know. I will gladly send you a copy beautifully illustrated. I'll tell you how to get into business for yourself. No colored students accepted.

E. J. Sweeney, President

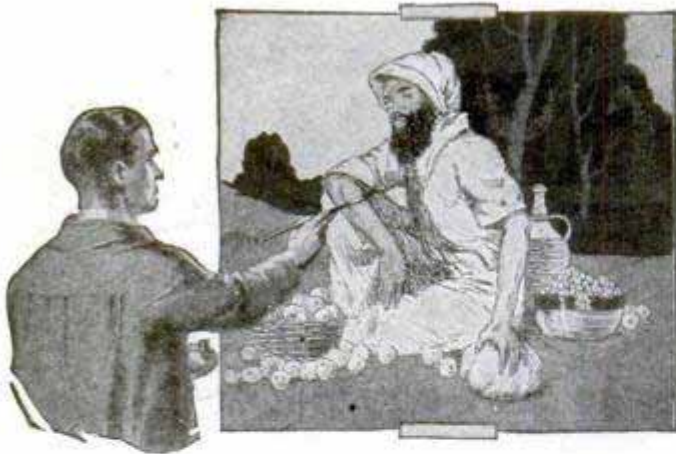
EMORY J. SWEENEY, President
3731 Sweeney Building, Kansas City, Mo.

Send me free, without any obligation, your catalog and Special Offer!

NAME.....

P. O.

STATE.....AGE.....



DRAWING *is a way to* FORTUNE

ALI HAFED, a Persian farmer, sold his acres to go out and seek his fortune. He who bought the farm found it contained a diamond mine which made him fabulously rich. Ali Hafed overlooked the great opportunity at his door to go far afield in search of wealth—which illustrates a great truth.

Do You Like to Draw?

If you do, it is almost certain that you have talent, a talent which few possess. Then don't follow Ali Hafed's example and look further for fortune. Develop your talent—your fortune lies in your hand!

Earn \$200 to \$500 a Month and More

Present splendid opportunities in the field of illustrating never excelled. Publishers buy millions of dollars' worth of illustrations every year. Illustrating is the highest type of art and it is fascinating as well as profitable.

The Federal Course includes illustrating, cartooning, lettering, poster designing, window card illustrating, etc. No one artist is competent to give instruction in all these branches. That's why the Federal School has established its "Master Course," in which every subject is written by a specialist. No other School can offer a course nearly comparable. No other institution in the country has such an array of artists as are on the Federal Staff.

Federal Course Gets Results

Its authors include such nationally known artists as Sid Smith, Neyssa McMein, Fontaine Fox, Charles Livingston Bull, Clare Briggs, Norman Rockwell and over fifty others. Exclusive lessons and drawings especially prepared by them are included in the Federal Home Study Course. They guide you from simple sketches to complex illustrations having a high market value.

Mail in the coupon below today and we will send you our free illustrated booklet, "A Road to Bigger Things."



Federal School of Illustrating

Federal School of Illustrating,
5137 Federal School Bldg., Minneapolis, Minn.

Name.....Age.....

Occupation.....

Address.....

Don't Envy The Plumber BE ONE!

\$11.00-\$16.00 PER DAY and work EVERY day, is the Plumber's wage.

Every skilled workman will tell you that Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job—compare his opportunities with any trade, plus the opportunities of having your own shop.

We teach you Plumbing with TOOLS (not books) under Licensed Master PLUMBERS in one of the finest equipped schools in America. We make you a Plumber, every branch is taught thoroughly—Lead Work—Blue Print for plan reading—all other tricks.

LEARN IN 8 to 12 WEEKS without previous experience.

If you are making less than \$60.00 a week you owe it to yourself to investigate. Get FREE catalog that tells in pictures and words how we teach this trade. Special rates now.

UNIVERSAL PLUMBING SCHOOL
2030 Troost Ave. KANSAS CITY, MO.

Electrical Engineering

Course for men of ambition and limited time. Over 5000 men trained. Condensed course in Theoretical and Practical Electrical Engineering including the closely related subjects of Mathematics and Mechanical Drawing.

Students construct motors, install wiring, test electrical machinery. Course designed to be completed in one college year. Prepare for your profession in the most interesting city in the world. Est. 1893. Catalog on request.



Bliss Electrical School

115 Takoma Ave., Washington, D. C.

LEARN WATCH REPAIRING



You can learn by our modern and original system of instruction every part of the **Watch Repairing Trade** at home as good or better than at a shop. You can earn money while learning and secure a well paying position or start in business after completing our course of instruction. Good watch repairers are always in demand and earn from \$50 to \$75 per week. For particulars apply to the **Wisconsin School of Watch Repairing** 166 Mason St., MILWAUKEE, WIS.

PIANO JAZZ

By Note or Ear. With or without music. Short Course. Adult beginners taught by mail. No teacher required. Self-Instruction Course for Advanced Pianists. Learn 259 styles of Bass, 684 Syncopated Effects, Blue Harmony, Oriental, Chime, Movie and Café Jazz, Trick Endings, Clever Breaks, Space Fillers, Sax Slurs, Triple Bass, Wicked Harmony, Blue Obligato, and 247 other Subjects, including Ear Playing. 133 pages of REAL Jazz, 25,000 words. A Postal brings our FREE Special Offer.

Waterman Piano School, 1826 W. Adams St. Los Angeles, Cal.

**HEALTHY
GOV'T
JOBS**

MEN-WOMEN, 18-60,
wanting Forest Ranger,
Railway Mail Clerk, Border
Patrol Guard, Mail
Carrier, P. O. Clerk,
Matron, and other Gov't
Positions, local or travel-
ing. For particulars write
Mr. Orment, Dept. 111
St. Louis, Mo.

**IN OR
OUTSIDE
WORK**
\$140-\$300
MONTHLY

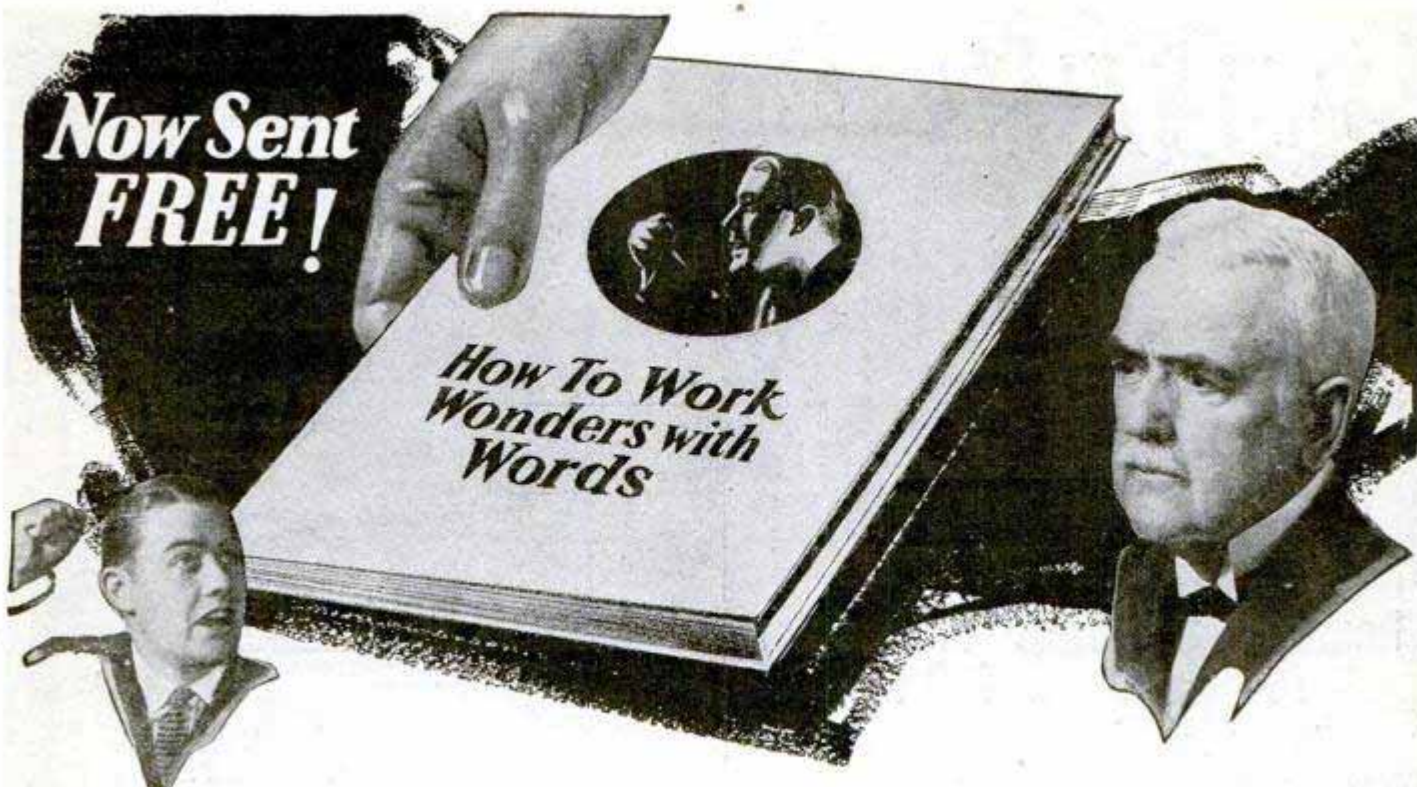
YMCA

Learn Auto Mechanical, Auto Electrical, Battery,
Machine, Electrical, Radio Mechanical, Tiling,
Bricklaying, Plastering, Plumbing, Welding,
Drawing, Estimating, Show Card, Sign Painting,
Window Dressing. Write for Catalog 50.

BROOKLYN ENGINEERING INSTITUTE
(Operated by Bedford Br. Y. M. C. A.)
1125 Bedford Ave., Brooklyn, New York City.



STAMMERING
easily, permanently corrected. Win hap-
piness and success. Ask for full information
and special phonograph record. Send dime for postage
153 Stimson Ave., The LEWIS INSTITUTE, Detroit



Not Only Men Who Have Made Millions Send for this Astonishing Book ~but Thousands of Others!

Many successful business men have sent for this amazing book NOW MAILED FREE. Such men as Walter C. Ford, of the Ford Manufacturing Company; C. F. Bourgeois, President of Robischon and Peckham Company; H. B. McNeal, President of the Telephony Publishing Company, and many other prominent, prosperous business executives, are unstinting in their praise of it. But don't think it is only for big men. Thousands of young men have found in this book the key to advancement in salary and position, popularity, standing, power and real success.

TODAY business demands for the big, important, high-salaried jobs men who can dominate others. It is the power of forceful, convincing speech that causes one man to jump from obscurity to the presidency of a great corporation. Another from a small, unimportant territory to the sales-manager's desk. Another from the rank and file of political workers to a post of national prominence as a campaign speaker. A timid, self-conscious man to change almost overnight into a popular and much-applauded after-dinner speaker.

Either You Become a Powerful Speaker —or Your Training is Free

You are shown how to conquer stage fright, self-consciousness, timidity, bashfulness and fear—those things which keep you

silent while men of lesser ability get what they want by the sheer power of convincing speech. You are told how to bring out and develop your priceless "hidden knack"—which will win for you advancement in position and salary, popularity, standing, power and real success. This simple, easy, sure and quick training is guaranteed to do this—or it will not cost you a single penny.

Only 15 Minutes a Day Required

There is no mystery about the power to work wonders with words. It makes no difference how embarrassed or self-conscious you now are when called upon to speak. Certain

principles will show you how to rise head and shoulders above the mass and make yourself the dominating figure in any gathering. How to rise to any occasion and demand what you want with force, vigor and conviction. Give only fifteen minutes a day in the privacy of your own home and you can accomplish all this in a few short weeks.

Make This FREE Test

If you will fill in and mail the coupon at once you will receive this remarkable new book, "How to Work Wonders with Words," which gives you an amazing test by which you can determine for yourself in five minutes whether you are one of the seven men out of every nine who possess the "hidden knack" of powerful speech, but do not know it. Decide for yourself if you are going to allow fifteen minutes a day to stand between you and success. Thousands have found this to be the biggest forward step of their lives. If it has played such an important part in the lives of many big men, may it not in yours?

North American Institute

Dept. 1355, 3601 S. Michigan Ave.

Chicago, Ill.

North American Institute,

Dept. 1355, 3601 S. Michigan Ave., Chicago, Ill.

Please send me FREE and without obligation my copy of your inspiring booklet, "How to Work Wonders With Words" and full information regarding your Course in Effective Speaking.

Name.....

Address.....

City.....State.....

What 15 Minutes a Day Will Show You

- How to address business meetings.
- How to propose and respond to toasts.
- How to make a political speech.
- How to tell entertaining stories.
- How to write better letters.
- How to enlarge your vocabulary.
- How to develop self-confidence.
- How to acquire a winning personality.
- How to strengthen your will-power.
- How to be the master of any situation.

ELECTRICITY



OFFERS BIG PAY

I WILL TRAIN YOU AT HOME

Thousands of "Cooke" Trained Men Are Making \$3,500 to \$10,000 a Year

You want to make big money! You want to earn more than a mere \$20 to \$30 a week! Of course you do. Then get into Electricity, the field of big pay and bigger opportunities. I'll train you at home—in your spare time. You work just as you are working now—at your same old job. But you learn electricity every day, in an easy, simple, unforgettable way—by doing.

You Earn As You Learn!

That's the way I teach Electricity—so that you can make extra money as you go along. That's why my Course is practical. That's why my students are successful. That's why the "Cooke trained man is the Big Pay Man" everywhere, and always. \$40 a week is just an ordinary salary in Electricity. \$70 to \$200 a week is what thousands of "Cooke" Trained Men are earning.

Nothing Like "Cooke" Training

Don't be satisfied with anything but "Cooke" training, the Course with 10,000 boosters. There is nothing like it anywhere. It stands by itself—alone in this field. This is the training that Electrical Men are praising—the training that Big Electrical Companies select for their employees—the training that has put thousands of men into big-pay jobs. Before you select any Course find out about "Cooke" training—about its 16 guaranteed features—its long record of proven successes—and my Satisfaction-or-Money-Back Agreement.

If You Are Earning Less Than \$70 a Week—MAIL COUPON

Don't wait a minute! Find out today why "The Cooke Trained Man is the Big Pay Man" everywhere! Find out how Cooke Training will help you boost your pay! Mail the coupon for my big book of proof, pictures and Pay-Raising FACTS. Do it NOW!

L. L. COOKE, Chief Engineer

L. L. COOKE SCHOOL OF ELECTRICITY
Dept. 515 2150 Lawrence Avenue CHICAGO, ILL.

FREE BOOK COUPON-MAIL IT!

Chief Engineer Cooke,
Dept. 515—2150 Lawrence Ave.,
Chicago, Illinois

You may send me, entirely free and fully prepaid, your book, "Secrets of Success in Electricity," together with particulars about your Home Study Course in Electricity.

Name.....

Address.....

City.....State.....

Residents of Canada send coupon to R. A. Farrow, Special Representative, 7 Medbury Lane, East, Ont., Canada.

You Can Study at Home in Spare Time or Specialize At the School Under Personal Direction

Learn SIGN and SHOW CARD WRITING



In spare time few hours weekly

BIG money. Fascinating work. Unlimited field. Chance to own your business. Many earn \$50 to \$200 weekly. Easy and quick to learn.

We teach you in your spare time—few hours weekly—at home or school.

Thousands of successful graduates. Original and largest school devoted exclusively to this profession. Complete, thoroughgoing courses in all branches: Sign Painting, Show-Card Writing, Poster Designing and Commercial Lettering. Write for information and Strong's "Book of Facts."

Earn \$50 to \$200 Weekly

Painting, Show-Card Writing, Poster Designing and Commercial Lettering. Write for information and Strong's "Book of Facts."

STRONG'S DETROIT SCHOOL OF LETTERING

171 Stimson Ave. Est. 1899 Detroit, U. S. A.


For 100-page catalog of sign and show-card tools and materials, address Supply Dept

LAW

Free Book

Write today for FREE 128-page book, "THE LAW TRAINED MAN," which shows how to learn law in your spare time and earn more money. Qualify for a high salaried executive position or prepare to enter the practice of law. Study at home through the Blackstone Course prepared by 80 prominent legal authorities including CHIEF JUSTICE WILLIAM HOWARD TAFT. Blackstone graduates practicing law everywhere. LL. B. degree conferred. Magnificent 25 volume law library furnished immediately upon enrollment. Moderate tuition fee. Low monthly terms. Money Back Guarantee. Write for book today.

Blackstone Institute, Inc., 4753 Grand Blvd. Dept. 55 Chicago
America's Foremost Non-Resident Law School



MEN WANTED

TO LEARN

Motion Picture Projection

\$2,000 to \$4,000 a Year

Quickly learned. Short hours, big pay. Best equipped school in Michigan. Projectionists for Movie Houses and Road Shows.

MOVIE OPERATORS SCHOOL

61 Sproat Street, DETROIT, MICHIGAN

Earn \$75 Weekly Building Radio Sets

Join the Association! We train you to build and repair radio sets—start you in business—enable you to earn \$3 an hour upwards. **Free 5-Tube Radio Set to Members.** Write for special limited-time plan whereby your membership need not cost you a cent. Write today!

RADIO ASSOCIATION OF AMERICA
Dept. PM-5 4513 Ravenswood Ave., Chicago, Ill.

ENCYCLOPÆDIA BRITANNICA

in the New Form—at a saving of 40%

Write for full details. Address Dept. PM4

THE ENCYCLOPÆDIA BRITANNICA, Inc.
342 Madison Ave., New York City

LEARN WATCHMAKING AND ENGRAVING

BY OUR PROFIT-SHARING PLAN OUR GRADUATES SUCCEED

One of our Iowa students started in a very small way—now doing over \$30,000 a year. Another in Wisconsin, over \$10,000 the first year. Day or night classes. Call or write for FREE BOOK

Chicago School of Watchmaking, Dept. 2801, 4844 Lincoln Avenue, CHICAGO

Health Food Directory

How to select the proper foods for gaining weight; reducing; building vitality; disease resistance; constipation; building muscle, etc. Rates and tabulates standard branded foods. No other book like it. 150 pages of valuable information. Special price 25c, postpaid. Limited edition.

Macfadden Publications, Inc., Dept. P.M.5, 1926 B'way, N.Y. City

LEARN PHOTO-ENGRAVING!

Earn \$200 to \$500 monthly. Photography and Photo-Engraving taught in few months by largest college of its kind. Established 1893. Big demand for graduates.

Write for free book.

Illinois College of Photography, Box 457, Effingham, Ill.



"Can he really play?" a girl whispered.
"Heavens, no," Arthur exclaimed. "He
never played a note in his life."

They Laughed When I Sat Down At the Piano But When I Started to Play!—

ARTHUR had just played "The Rosary." The room rang with applause. Then to the amazement of all my friends, I strode confidently over to the piano and sat down.

"Jack is up to his old tricks," somebody chuckled. The crowd laughed. They were all certain that I couldn't play a single note.

"Can he really play?" I heard a girl whisper to Arthur.

"Heavens, no," Arthur exclaimed. "He never played a note in all his life. . . ."

I decided to make the most of the situation. With mock dignity I drew out a silk handkerchief and lightly dusted off the piano keys. Then I rose and gave the revolving piano stool a quarter of a turn. The crowd laughed merrily. Then I started to play.

Instantly a tense silence fell on the guests. I played the first few bars of Liszt's immortal Liebesträume. I heard gasps of amazement. My friends sat breathless—spellbound! I played on.

A Complete Triumph!

As the last notes of the Liebesträume died away, the room resounded with a sudden roar of applause. I found myself surrounded by excited faces. Everybody was exclaiming with delight—plying me with rapid questions. . . . "Jack! Why didn't you tell us you could play like that?"

. . . "Where did you learn?"—"Who was your teacher?"

"I have never even seen my teacher," I replied. "And just a short while ago I couldn't play a note."

"Quit your kidding," laughed Arthur, himself an accomplished pianist. "You've been studying for years. I can tell."

"I have been studying only a short while," I insisted. "I kept it a secret so that I could surprise you folks."

No Teacher Needed

Then I told them the whole story. "It seems just a short while ago that I saw an ad of the U. S. School of Music mentioning a new method of learning to play which only cost a few cents a day! The ad told how a woman had mastered the piano in her spare time at home—and without a teacher! The method she used required no laborious scales or exercises. It sounded so convincing that I filled out the coupon requesting the Free Demonstration Lesson."

"It arrived promptly and I started in that very night to study it. I was amazed to see how easy it was to play this new way. I sent for the course and found it was just as easy as A. B. C.! Before I knew it I was playing all the pieces I liked best. I could play ballads or classical numbers or jazz, with equal ease! And I never did have any special talent for music!"

Play Any Instrument

You too, can now learn music—right at home—in half the usual time. You can't go wrong with this simple new method which has already shown almost half a million people how to play their favorite instruments by note. Forget that old-fashioned idea that you need special "talent." Just read the list of instruments in the panel, decide which one you want to play, and the U. S. School will do the rest.

Send for our Free Booklet and Demonstration Lesson

Thousands of successful students never dreamed they possessed musical ability until it was revealed to them by a remarkable "Musical Ability Test" which we send entirely without cost with our interesting free booklet and Demonstration Lesson.

Right now we are making a Special offer for a limited number of new students. Sign and send the convenient coupon now—before it's too late. Instruments supplied when needed, cash or credit.

U. S. School of Music, 75 Brunswick Bldg., N. Y. C.

U. S. School of Music, 75 Brunswick Bldg., New York City.

Please send me your free book, "Music Lessons in Your Own Home," with introduction by Dr. Frank Crane, Demonstration Lesson and particulars of your Special Offer. I am interested in the following course:

Have you Instrument?

Name
(Please write plainly)

Address

City State

PICK YOUR INSTRUMENT

Piano	Clarinet
Organ	Flute
Violin	Cello
Drums	Harmony
and	and Com-
Traps	position
Banjo	Sight Singing
(Tenor,	Ukulele
Plectrum	Harp
or 5-String)	Cornet
Mandolin	Piccolo
Saxophone	Guitar
Hawaiian	Trombone
Steel	
Guitar	
Voice and Speech Cul-	
ture	
Automatic Finger Con-	
trol	
Piano Accordion	

CHEMISTRY

Learn
at
Home



THE Chemical Industry now ranks fourth among the industries of the United States and it offers a splendid opportunity for ambitious men.

Arthur D. Little emphasized this very point in his speech before the American Institute of Chemical Engineers when he said: "Industrial developments along new lines are everywhere in progress and they call upon the chemical engineer for new equipment and new methods of production and control."

One of the best ways for you to prepare for a good position in this fascinating field is through the home-study courses in Chemistry offered by the International Correspondence Schools.

These courses are complete and practical because they were prepared by some of the best-known chemists in this country, including:

ALLEN ROGERS, B.S., M.S., Ph.D.—Head of Department of Industrial Chemistry, Pratt Institute.

ANDREW M. FAIRLIE, B.S.—Consulting Chemical Engineer for the Tennessee Copper and Chemical Corporation; American Zinc, Lead and Smelting Co.; American Zinc Oxide Co., and the Baugh Chemical Co.

L. M. TOLMAN, Ph.D.—Formerly Chief Chemist, Wilson & Co. Now Vice-president, United Chemical and Organic Products Co.

BRADLEY STOUTON, B.S.—Head of the Department of Metallurgy, Lehigh University.

OWEN L. SHINN, Ph.D.—Professor of Applied Chemistry, University of Pennsylvania.

Qualitative and Quantitative Analyses Outfits are supplied with these I. C. S. Courses at special prices for your laboratory work at home, and the courses are so arranged that you get just the help you need to secure a good position in the work you like best.

Just mark and mail the coupon and we'll gladly send you Free Booklets describing the I. C. S. CHEMISTRY COURSES or any other course in which you are interested.

Mail the Coupon for Free Booklet

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 5647-E, Scranton, Penna.

Without cost or obligation, please send me one of your booklets, and tell me how I can qualify for the position or in the subject before which I have marked an X:

- | | |
|--|--|
| <input type="checkbox"/> Analytical Chemistry | <input type="checkbox"/> Analytical and Industrial Chemistry |
| <input type="checkbox"/> Chemical Engineering | <input type="checkbox"/> Short Chemistry Course |
| <input type="checkbox"/> Industrial Chemistry | <input type="checkbox"/> Pharmacy |
| <input type="checkbox"/> Metallurgical Chemistry | |

Also courses specializing in the Chemistry of the following industries

- | | |
|--|--|
| <input type="checkbox"/> Manufacture of Leather | <input type="checkbox"/> Manufacture of Iron |
| <input type="checkbox"/> Manufacture of Cottonseed Oil | <input type="checkbox"/> Manufacture of Steel |
| <input type="checkbox"/> Manufacture of Petroleum | <input type="checkbox"/> Manufacture of Sugar |
| <input type="checkbox"/> Manufacture of Sulphuric and Hydrochloric Acids | <input type="checkbox"/> Manufacture of Soap |
| | <input type="checkbox"/> Manufacture of Cement |

- | | |
|---|---|
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Steam Engineering |
| <input type="checkbox"/> Electric Lighting | <input type="checkbox"/> Architect <input type="checkbox"/> Radio |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Architects' Blueprints |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Contractor and Builder |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Architectural Draftsman |
| <input type="checkbox"/> Railroad Positions | <input type="checkbox"/> Concrete Builder |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Structural Engineer |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Airplane Engines |
| <input type="checkbox"/> Metallurgy <input type="checkbox"/> Mining | <input type="checkbox"/> Mathematics |

Name.....

Street Address.....

City.....State.....

\$2500 DRAWING \$298 COURSE for



Haven't you often wished that you could draw cartoons, illustrate some idea, sketch some pretty face, etc.? You can do all of these things. One of America's most famous Cartoonists and Illustrators has developed a great, simple system for success in all branches of Commercial Art. This system has revolutionized the entire theory of drawing. It means that drawing can be as easy for you as writing—much simpler than learning shorthand, bookkeeping or typewriting. We are now placing this original system for learning Drawing, Art and Cartooning, consisting of 34 lessons with over 500 illustrations, within reach of every one. If you will devote a few hours each week to the Course WE ABSOLUTELY GUARANTEE that you will learn to draw and draw well before you have half finished the Course. If we fail to make this claim good, we will refund every cent paid us. By eliminating a large office force for answering correspondence, expensive catalogs, etc., we are enabled to make a price of \$2.98, the cheapest price ever known for a high-grade, home study course. Many have sent us letters similar to that of Rob't P. Davis of Detroit, who wrote: "I can't see how you ask so little. It is more than I expected." Learn to draw. It is a big asset, no matter what field you are in.

Send No Money

Just order the course and \$2.98 on arrival pay postman plus a few cents postage, payment in full for the entire Course and Drawing Outfit. If not entirely satisfied, return within five days and we will Refund Money. Address:

LEDERER SCHOOL of DRAWING, Dept. 3480-K, Chattanooga, Tenn. Orders from outside the U. S. A. are payable \$3.28 cash with order.

If you order the course at once, we will include a drawing outfit, consisting of artist's pencils, pens, paper, erasers, thumb tacks, etc., enabling you to go to work without any additional cost.



Make Money in Photography!

We train you quickly at home. No experience necessary. Spare time or full time. Photographs in big demand by magazines, newspapers, advertisers, etc. Portrait Photographers make more money today than ever before. Commercial Photography also pays big money. New plan. Nothing else like it. Write today for details and new FREE book, "Opportunities in Modern Photography."

American School of Photography
Dept. 1355 3601 Michigan Ave. Chicago, Ill.



Wonderful, new device, guides your hand; correct your writing in few days. Big improvement in three hours. No failures. Complete outline FREE. Write C. J. Oxment, D-34, St. Louis, Mo.

FOREST RANGERS

MEN, GET FOREST RANGER JOB; \$125-\$200 MO. AND HOME FURNISHED; PERMANENT; HUNT, FISH, TRAP. FOR DETAILS, WRITE NORTON, 226-B, McMANN BUILDING, DENVER, COLORADO

Comedies, Dramas, Musical Comedies, Vaudeville Acts, and Revues, Minstrel, How to Stage a Play, Choruses, Songs, Blackface plays. Everything for Burnt Cork Shows and All Amateur Entertainments. Monologs, Dialogs, Speakers. CATALOGUE FREE

T. S. DENISON & CO., 623 So. Wabash, Dept. 9, CHICAGO

Skin Troubles

Cleared up—often in 24 hours. To prove you can be rid of Pimples, Blackheads, Acne Eruptions on the face or body, Barbers' Itch, Eczema, Enlarged Pores, Oily or Shiny Skin, simply send me your name and address today—no cost—no obligation. CLEAR-TONE tried and tested in over 100,000 cases—used like toilet water—is simply magical in prompt results. You can repay the favor by telling your friends; if not, the loss is mine. WRITE TODAY. E. S. GIVENS, 428 Chemical Bldg., Kansas City, Mo.



FREE BLUE PRINTS

AND FREE BOOK "HOW TO READ BLUE PRINTS"

SHOW YOU THE WAY TO 9 BIG PAY JOBS

- | | |
|---|--|
| 1 Building Superintendent—\$5,000 to \$12,000 | 6 Building Estimator—\$6,000 to \$10,000 |
| 2 Building Inspector—\$4,800 to \$8,000 | 7 Real Estate Expert—\$5,500 to \$12,000 |
| 3 Appraiser—\$6,000 to \$10,000 | 8 Construction Foreman—\$4,500 to \$8,500 |
| 4 Material Buyer—\$5,000 to \$7,500 | 9 CONTRACTOR AND BUILDER IN A BUSINESS OF YOUR OWN—\$5,000 to \$12,000 |
| 5 Material Salesman—\$5,000 to \$12,000 | |

**FIND
OUT HOW**
Easy it is to Make
\$4,500 to \$12,000 a Year

Learn to read Blue Prints this amazing new way! Get into the world's richest industry—Building! See how quickly and easily you can train to make \$4,500 to \$12,000 a year! My FREE Book "How To Read Blue Prints" discloses all the so-called "mysteries" of Blue Print Reading—also gives some startling facts about the nine best jobs in America. Don't send one penny—just mail the coupon!

NO longer need you spend years trying to pick up the "mysteries" of Blue Print Plan Reading. For now a quick, sure practical method has been perfected that has made thousands of men Blue Print Experts in a surprisingly short time.

This is no ordinary "school course." It is practical from start to finish. It is based on many sets of real Blue Prints—plans that would cost thousands of dollars if purchased from architects. Twenty famous experts in all lines of construction work talk over these Blue Prints with you in plain simple language. Show you every detail. Explain every short cut. Tell you the "secrets" of quick, accurate estimating. Explain Superintending. Give you for the first time many inside facts and money-making methods used by the "Giants" of the Building Industry.

This is the kind of training that quickly puts men into \$5,000 to \$12,000 a year jobs—or into profitable contracting businesses of their own. Yet now you get it right at home in only 2 or 3 months. It requires no extensive education. If you can read and understand what is written here you can easily master it.

See what this training has done for others: Bartholomew, Calif., became a contractor at an in-

crease of over 300% his first year; Blair, Okla., stepped up to Superintendent at 100% increase; Dickerson, R. I., increased his salary 700% in 12 months; Marchand, La., says "My income has increased 200% and I now have more contracting work than I can do."

Over seven billion dollars will be spent this year in new construction! No wonder then, such tremendous opportunities are open to you when you have this "head-work" training in Blue Prints.

If you want more money—real big money! Then choose a "Blue Print" job in Building. Clerk or Salesman, Carpenter or Bricklayer, here is the one field where there are unlimited opportunities for advancement.

So accept my FREE gift of a complete set of real working Blue Prints, and my fascinating Book "How to Read Blue Prints" that tells all the interesting and instructive facts about Blue Print Plans. Don't send one penny—pay no C. O. D.—it's all FREE.

Just fill out and mail the coupon today—NOW!

**TWO
BOOKS
also**

FREE



IF YOU LIVE NEARBY

Visit our big day or evening school attended by over 1000 Builders. You can get the same training at home by mail—same plans, lessons and instructor. Your spare time is enough.

Chicago Technical School for Builders—Dept. E-140, Chicago Tech. Building, 118 East 26th Street, Chicago, Ill.

Please send me your free book "How To Read Blue Prints" and complete set of real Blue Prints. I understand these are mine to keep without obligation. It is also understood that no salesman will call on me.

Name
Address
City State
Age Occupation

**Chicago Technical
SCHOOL for BUILDERS**

Dept. E-140, 118 East 26th St., Chicago, Ill.



LEARN TO DRAW CARTOONS

To Show You How Quickly and Easily You Can Do So
I'LL TEACH YOU

to draw comic faces like these in 15 minutes. Send me your name and address, and let me mail you a Test Lesson Chart which will teach you how to draw comic faces.



FRECKLES

Mere words cannot express my appreciation of the course of lessons I received from the Landon School.

Merrill Blosser.



BRANNER

WINNIE WINKLE

When I consider the small investment I made in taking your course and the enormous profits I am making now I feel like a profiteer.

M. M. Branner.



REG'LAR FELLERS

I attribute my success to the thorough and highly competent course I received from you.

Gene Byrnes.

Whether you think you have talent or not, make this interesting test.

I want to show you that with the aid of my PICTURE CHART METHOD of teaching original drawing you can learn to draw as easily as you learned to write. Every step in producing original heads, figures, animals, and all details of original cartoon drawing are PICTURED in an extensive series of Charts, and the text with each lesson shows how to apply the various steps in producing original drawings of your own. This plan is endorsed by nationally known newspaper artists and is today recognized as the most effective method of teaching drawing ever devised.


RESULTS TELL THE STORY

Here are three of the famous characters created by Landon students who have attained national reputations as Comic Strip Cartoonists. Former students of this School are producing cartoons on political and national affairs, sports, comic strips, etc., for leading newspapers and syndicates all over the United States and Canada. Many newspapers now employ from two to five students of this School; one big newspaper employs nine. Many successful students who prefer to work at home are selling their drawings by mail. The record of results produced by this school is evidenced by the demand for Landon graduates.


Send NOW for complete information and sample Picture Chart to test your ability. Please state your age, and enclose 6c in stamps for postage.

C. N. LANDON, Director.

The Landon School
1238 National Bldg., CLEVELAND, OHIO



QUIT WISHING AND WAITING EARN



\$3500 to \$5000 a Yr.

MAKING CROWNS, PLATES, BRIDGES, etc. for DENTISTS

Three Months'
Training
Will Qualify
You for
Success



Hundreds More
Dental Mechanics
Needed Now
and Demand
Is Increasing

YOU LEARN BY DOING

Individual instruction — no classes whatever. Each student is taught by practical work but is given theoretical training as well. In our regular dispensary, conducted by M. Stein, D.D.S., advance students are also given practice in precious metals on actual cases.

R. R. FARE INCLUDED—OTHER ASSISTANCE

Besides providing this exceptional training at the lowest possible cost and refunding the student's R. R. fare to our nearest school, we have plenty of part time jobs on file for those who need to earn while learning. No additional charge for Tools and Materials. Easy Terms. For full information just write today for Free Bulletin No. 2.

BODEE DENTAL INSTITUTE

Established over 35 years
The Pioneer in this Field

New York Philadelphia
1755 Broadway 1305 N. Broad St.

Brooklyn
85 Court St.

THE PRICE GOES UP! Act now and save **\$4.00**

Get your Croft LIBRARY OF PRACTICAL ELECTRICITY now before the price is raised. Increased costs are making it necessary to raise the price of this famous library to \$23.50. If you act now instead of waiting, you save \$4.00. Act today! Mail the coupon now!

The Croft Library of Practical Electricity

A combined reference library and home study course, 8 volumes, 3000 pages, 2100 illustrations, flexible binding, \$1.50 in ten days and \$2.00 monthly for nine months—only 7 cents a day.

The man who gets anywhere in any line of endeavor is the man who KNOWS. And generally the more he knows the more he earns. For the man who wants to know, there is nothing better than these eight volumes packed to the covers with sound, helpful information on every phase of electricity from first principles to central station work.



SEE IT FREE—

No obligation to Purchase

By just filling out and returning the coupon below you will have, at no cost to you whatsoever, a practical, useful set of books for 10 days' Free Examination. We take all the risk—pay all charges. You assume no obligation—you pay nothing unless you decide to keep the books. Send the coupon NOW and see the books for yourself.

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York
Send me for 10 days' free examination the Croft Library of Practical Electricity. If satisfactory I will send you \$1.50 in 10 days and \$2.00 monthly until the special price of \$19.50 is paid. If not wanted, I will return the books at your expense.

Signed.....

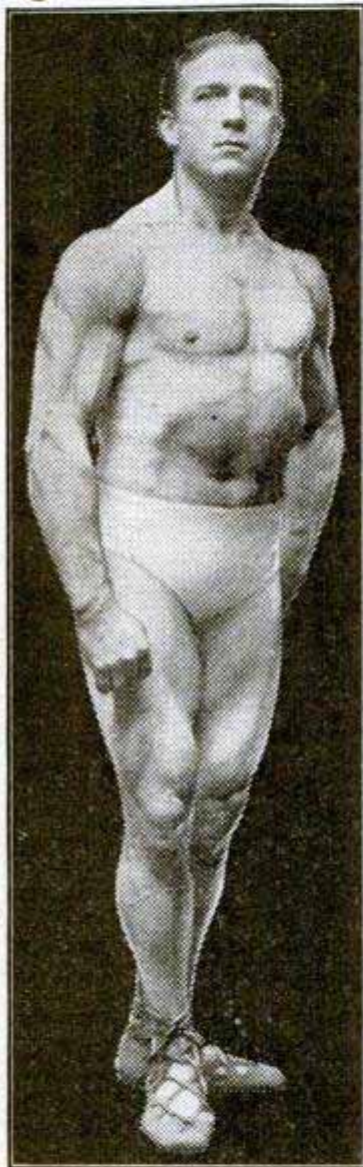
Address.....

City and State.....

Position.....


Employer..... P. M. 5-1-27

Are You Jealous of Your Physical Superiors?



STRONGFORT
Builder of Men

From a Brooklyn Pupil:

"Your Course is so different from other courses—it's like leaving kindergarten and going into college—and I know whereof I speak because I've tried at least three others that are prominently advertised. You make these fellows look as though they did not know what a P. C. Course was." 

Do you look with envy and hatred upon the man who stands out in a crowd the picture of health and vigor and strength—the real manly fellow? Do you sneer at the peppy pugilist, the powerful wrestler, the speedy runner, the graceful dancer—do you call them "big stiffs"?

Beware, young fellow, if this is your feeling towards strong, healthy men—you are filled with jealousy! **You feel your own weakness.** In your heart you wish you were like these fellows. You want to be strong and healthy. You want to command the attention of men and the admiration of women—you wouldn't be half a man if you didn't. You know your own weaknesses even if you are hiding them from others, and you envy those who are your superiors—those who seem to get the center of the stage wherever they are. They are the "life of the party" always, everywhere. They are the fellows that get all the promotions, all the good jobs.

There's No Place for Weaklings

—and you needn't be a weakling—you needn't be jealous—you needn't have physical superiors—you can be strong and healthy yourself. You don't have to go on ailing and complaining. You don't have to be ashamed of your weakness—even though you know better than anyone else what brought you to your present condition. There's a way out of your dilemma. You are no different from thousands of others that have gone the pace, dissipated their strength and are paying the penalty. You can be put back on your feet. You can be made a 100 per cent man—energetic, vigorous, alert, ambitious, happy!—it's all up to you; it's for you to say whether you are going to go on being a shiftless, useless derelict or be an upstanding man among men.

STRONGFORTISM Science of Health and Strength —Will Do Wonders for You

It was through the methods I used in developing my own body until I won the world's record as the finest specimen of muscular development and championships in feats of great strength, in Europe and in the United States, that I constructed the science of STRONGFORTISM. It is through it that I reclaim wrecked and weak men, make them into new beings and give them a body and arms of which they can boast. I require you to use **no apparatus**. **No drugs or medicines** are prescribed. No inconvenient hours are required. Only a little of your time, in the privacy of your own home, is necessary to follow my easily understood instructions—and, oh man, how glad you'll be that you listened to me, once you start on my course. It means a new day for you, that's sure as you're alive.

Send for My FREE BOOK

I've packed the experience and research of a lifetime of physical and health building into my startlingly interesting book, "PROMOTION AND CONSERVATION OF HEALTH, STRENGTH, AND MENTAL ENERGY." IT IS PRICELESS. In it are plain facts that will astonish you and help you out of your sorry plight. Just check the subjects on the free consultation coupon on which you want special confidential information and write me today. Don't delay.

Send for your copy of this book right now—TODAY!

Send this FREE Consultation Coupon ABSOLUTELY CONFIDENTIAL

Mr. Lionel Strongfort, Strongfort Institute, Dept. 331, Newark, N. J. —Please send me absolutely free my copy of your book, "PROMOTION AND CONSERVATION OF HEALTH, STRENGTH AND MENTAL ENERGY." I am enclosing ten cents (one dime) to help cover mailing expense, etc., and I have marked (X) before the subjects in which I am most interested.

- | | | |
|-----------------------------------|---------------------------------------|--|
| <input type="checkbox"/> Catarrh | <input type="checkbox"/> Overweight | <input type="checkbox"/> Great Strength |
| <input type="checkbox"/> Colds | <input type="checkbox"/> Constipation | <input type="checkbox"/> Lung Troubles |
| <input type="checkbox"/> Asthma | <input type="checkbox"/> Weak Back | <input type="checkbox"/> Round Shoulders |
| <input type="checkbox"/> Headache | <input type="checkbox"/> Weak Eyes | <input type="checkbox"/> Stomach Disorders |
| <input type="checkbox"/> Rupture | <input type="checkbox"/> Rheumatism | <input type="checkbox"/> Increased Height |
| <input type="checkbox"/> Thinness | <input type="checkbox"/> Nervousness | <input type="checkbox"/> Muscular |
| <input type="checkbox"/> Pimples | <input type="checkbox"/> Short Breath | <input type="checkbox"/> Development |
| <input type="checkbox"/> Insomnia | <input type="checkbox"/> Weak Heart | |

Other Ailments.....


Name.....

Age..... Occupation.....

Street.....

City..... State.....

STRONGFORT INSTITUTE
LIONEL STRONGFORT, DIRECTOR.
PHYSICAL AND HEALTH SPECIALIST
DEPT. 331 NEWARK, NEW JERSEY, U.S.A.



*Freedom
from a
Small-Pay Job
Come to New York
the city of 100,000 jobs*

ANY MAN who can read and write and use a pair of pliers can become an electrical expert and free himself forever from the long hours and drudgery of a small pay job.

And you can learn the BIG PAY profession of electricity right in New York City—the heart of the electrical world—the city of 100,000 jobs. At the same time you are learning the BIG PAY profession you can be enjoying the sights and wonders of New York, the modern Bagdad.

Be An Electrical Expert

Graduates of the **NEW YORK ELECTRICAL SCHOOL** are in demand by all the big electrical companies. Or, if you prefer the independence of a business of your own, there are thousands of opportunities for efficient, dependable men to become electrical contractors. When you are your own boss the money you can make is limited only by your own energy and ability.

Personal Instruction

The **NEW YORK ELECTRICAL SCHOOL** is not a correspondence school. You learn by doing—by personal instruction on full size standard electrical equipment under the personal supervision of trained instructors.

At N. Y. E. S. you train your hands and mind at the same time. You learn the theories of electricity—and then you are shown how to put the theories into actual practice by solving the problems with your own hands.

The man who has learned electricity by actually doing electrical work under intelligent personal instructors can go to any part of the world and be sure of a good living. There are N. Y. E. S. graduates in all the countries of the world.

Write today for the 48-page booklet giving full information about the N. Y. E. S. Course and showing pictures of the equipment available for your personal use in our two seven-story buildings. Mail coupon now! The New York Electrical School, 44 W. 17th Street, New York.

The New York Electrical School
44 W. 17th Street, New York

Please send me FREE your 48-page booklet. It is understood that this request puts me under no obligation.

Name.....

Address.....



Step into a BIG PAY Hotel Job

Earn \$2,500—\$10,000 a Year

in America's 4th Largest Industry. Hotels, Clubs, Restaurants, Institutions, Schools, Colleges, Hospitals, etc., are daily calling for Lewis Trained men and women. Over 70,000 high class positions paying \$2,500 to \$10,000 a year open annually in hotels alone. Salaries up to \$3,500 a year to start. We put you in touch with positions.

Previous Experience Unnecessary

Without cost let us show you how big pay, fascinating work, quick advancement can be yours in the great hotel industry. Age is no obstacle—young and old alike have equal chance for success. A common school education is all you need with the amazing Lewis system of spare-time home training in hotel operation. Our students employed, our methods endorsed by leading hotel men everywhere. Low cost—easy terms—money-back agreement.

Write today for FREE BOOK "Your Big Opportunity" and complete details, mailed without obligation.

LEWIS HOTEL TRAINING SCHOOLS

Clifford Lewis, Pres.

Room AF-363 Washington, D. C.

Charter Member of National
Home Study Council.

Send for FREE Book



Wanted—Cartoonists!

Increasing demand for cartoonists cannot be filled. Get in on the big money by learning the Manuel Rosenberg Course in CARTOONING—based on fifteen years' experience as cartoonist on Scripps-Howard and other newspapers. Complete Course teaching drawing and cartooning—100 big illustrated lessons postpaid, for only \$5.00—or only five cents a lesson. Send postal order, check or currency—or we will send it C. O. D., you to pay postman. Write TODAY!

MANUEL ROSENBERG, Room 3, Artists' Bldg., Cincinnati, Ohio

Tri-State College of Engineering

Makes you a civil, mechanical, electrical or chemical engineer in 96 weeks. No entrance examinations. High school diploma not required. Compact courses of essentials only. Expenses low. Degree granted. Enter Sept., Jan., March, June. For catalog address, **Box M-57, Angola, Ind.**

Learn Watchwork, Jewelrywork and Engraving

A fine trade commanding a good salary, and your services always in demand. Address: **Horological, Dept. P. Bradley Institute, PEORIA, ILLINOIS**, for our latest catalog.

MINSTRELS

Musical Comedies and Revues, with full instructions for staging. You can stage your own show with our books. Full line of plays, stage songs, crossfire, monologues, afterpieces, vaudeville acts and make-up. CATALOGUE FREE

T. S. DENISON & CO., 623 So. Wabash, Dept. 19, CHICAGO



Anyone CAN LEARN

No talent or experience necessary. Fascinating work. Pays big money. Complete instruction book tells about: Alphabets, Colors, How to Mix Paints, Show Cards, Window Board and Wall Signs, Ready made letters, Gilding, Tricks of the Trade, also gives 100 Alphabets and Designs. Book bound in flexible int. leather-gold edges, and four half bearing Show Cards. Pens. Sent postpaid \$3.00, (C. O. D.) 10c ex.

Quilley Pub. Co., 57 Rose St., Dept. 20, N. Y. City

EARN MONEY IMMEDIATELY—WE FURNISH EQUIPMENT TO START!!

How to Earn SIGNS and Show Cards \$3

From "Puny" to PANTHER-MAN



BEFORE

This lad looked pretty hopeless when he came to me. His arms looked like sparrow wings with the feathers removed. His ribs stood out and his bones tried to poke through his skin all over his body. His chest was hollow, his neck was scrawny. He had sluggish blood circulation and jumpy nerves. He couldn't sleep. Then he took my course.

physical culture! You don't want an imitation body, you want a real one! Then get your training from a real trainer.

Wear This Medal

Every TITUS graduate gets this magnificent, solid, statuary-bronze medal of merit. To many strong men it was the beginning of a collection of medals, cups and prizes won by their feats of strength. Get yours and begin your career. One of the finest and most artistic medals ever designed for an athletic event. Free to all TITUS graduates. WRITE NOW!



**MY NEW BIG BOOK IS A KNOCKOUT
AND IT'S YOURS FREE—**

Better Built Bodies

It contains true stories—stories of miracles worked in muscles. It's chock-full of actual photographs of myself and bodies I have rebuilt all over the world. Learn how Physical Culture Authorities keep in the "Pink" of condition. Read for yourself, the story of Mr. I. R. Gaynor, a former invalid, who couldn't stand on his feet. See what a Physical Marvel and Athlete I made of him in 30 days. My record in muscle building will open your eyes.

Fellow, if that body of yours is worth 2 cents—invest it in a stamp and shoot the coupon along NOW for your copy of this wonderful book. Make this day the turning point in your life. Do it now—you may forget!

No strings, no obligations—Better Built Bodies is yours—FREE!

TITUS Dept. P-114 105 East 13th St.
NEW YORK, N. Y.

LOOK at these two pictures! **LOOK** at them!! Then go peek into your mirror and see which one of them is more like you. Never mind blushing! Don't waste time being ashamed! There's no need of staying that way!

The chap in the picture got next to himself. They nicknamed him "Puny"—once. But the man who calls him "puny" now will have a battle on his hands. And the best part of it is that not only his appearance but his whole LIFE has been changed! Instead of waking up in the morning with burning eyes and heavy head, instead of ducking all sports that require strength, he eats 'em up! He's full of pep, stamina, strength and vitality. He never knows when to quit—and it doesn't matter. His body can stand the gaff, whatever it is. Do YOU want a body like that?

THE ONE AND ONLY TITUS

The TITUS System, the system that has trained thousands of the world's strongest men, the system that covers bodies with panther muscles will make a new man of YOU!

But there's a big bag of tricks that the "Daddy of 'em All" never opened. There is only one TITUS! There is only one place on earth where the TITUS panther-building system can be bought! That place is TRAINING HEADQUARTERS—the home of



30 DAYS AFTER

What a man! In thirty days I built the fellow you see above. I loaded his bones with muscles! I gave him a body that laughs at hardships and illness. He says, "No other apparatus and instruction can touch yours! When the human body will hold another muscle—Titus will put it there!"

**WIN
\$1,000.00**

The mammoth 1926 Prize Contest is closing now. Someone is going to be \$1,000 richer! If you were not entered in that contest, get started in the new one now! Full particulars of the 1927 Contest will be included with my big free book. Mail the coupon NOW.

WRITE NOW!

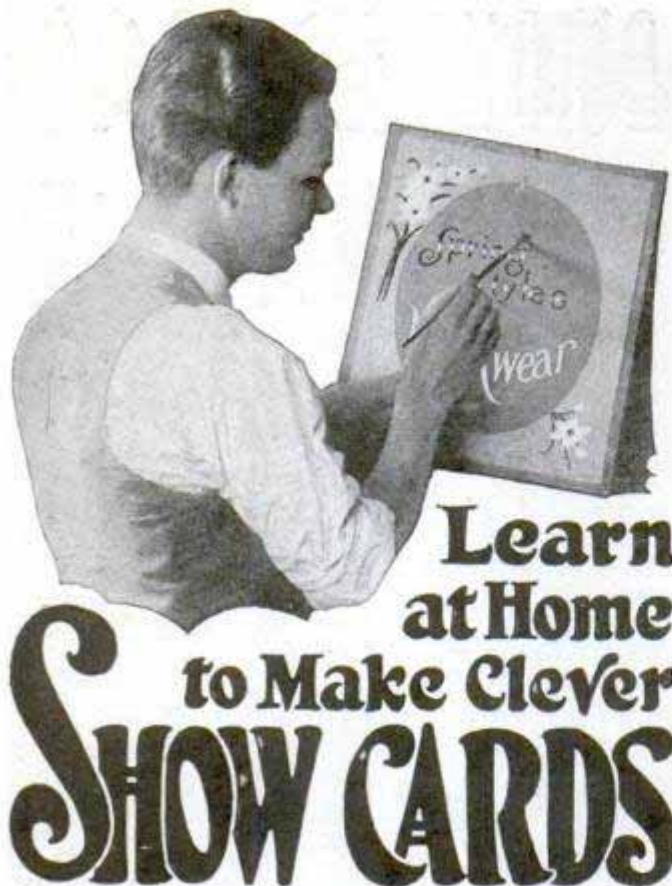
Titus, Dept. P-114,
105 East 13th Street, New York City.

Dear Sir: Mail my copy of your Big New illustrated Book, "Better Built Bodies," absolutely FREE and without obligation. Also include particulars of your \$1,000 Prize Contest.

Name.....

Address.....

City.....State.....



A Profitable Business of Your Own for full or spare time. Earn \$25 to \$50 a week in spare time. Double your pay. Practical method of home instruction makes learning easy.

Why work for low pay? Clever "sales-increasing" display material is always needed by progressive business enterprises of every description. \$10 to \$20 is often paid for a single attractive show card. Skilled Show Card Writers command high salaries—right from the start.

Prepare now. No special ability needed. Learn at home in your spare time through a most complete and practical method. We develop your originality and teach you how to make attractive show cards, just like a professional. We give all of your work personal attention through the mail. Scores have learned Show Card Writing this quick, easy way and are now making more and more money each week. **SO CAN YOU.**

Take advantage of the wide range of money-making opportunities always open in the Show Card field. Make original Show Cards for your own employer or work for several merchants at the same time. Establish a profitable business of your own. Show Card experts earn up to \$110 a week—and more if you're ambitious.

Send for FREE Book

Get busy. Boost your pay. Don't delay your preparation for this uncrowded, lucrative profession. Write today for our big Free Book, full of illustrations. Gives complete details of our practical home-study course. Mail coupon NOW! **WASHINGTON SHOW CARD SCHOOL, Dept. 305-E, 1117-15th Street, N. W., WASHINGTON, D. C.**

**Washington Show Card School, Dept. 305-E
1117-15th Street, N. W., Washington, D. C.**

Please send me FREE and without obligation, a copy of the new 32-page book, "Quick Success In Show Card Making."

Name.....

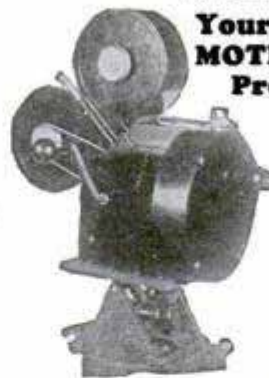
Address.....

City..... State.....

CAMERA GIVEN

Without Extra Charge

Your Choice—\$100 Professional MOTION PICTURE Camera or Professional VIEW Camera



BE a Motion Picture Cameraman, Portrait, News or Commercial Photographer. Earn a handsome salary or own a studio and set your own prices! No experience needed. Spare time work. Big money to be made while you are learning!

Learn Photography

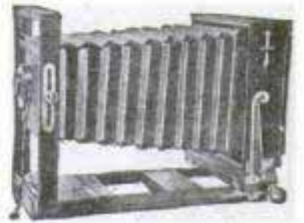
A few minutes a day at home fits you for a big paying position and you get your choice of these standard professional cameras. Instruction also given in our great New York studios.

Cameramen and photographers are *always* in demand. You can quickly qualify for this easy, fascinating work.

Earn \$75 to \$250 a week

Big money in all branches. Hundreds of positions now open pay \$75 to \$250 a week and more! The most interesting profession in the world.

Send name and address for big, new, illustrated book on Professional Photography. Explains amazing opportunities. Write for your copy tonight!



**NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 49, 10 West 33rd St., NEW YORK CITY
Write NOW for FREE BOOK**

Your present dull? The FUTURE is YOURS to make—

The present of a newspaper man is interesting—exciting—full of action and variety. He's learning life, at first hand, every minute he works.

He may turn his experiences into stories, plays, movies (hundreds of our greatest writers got their start on a newspaper). Or he may utilize his knowledge to forge ahead faster in other fields—banking, industry, politics.

A new way to get newspaper training

The Newspaper Institute of America (an organization of New York newspaper men approved as a correspondence school under the laws of the State of New York) was formed to teach journalism to ambitious men and women who appreciate its possibilities.

In the N.I.A. you learn to write by *writing*. Without leaving your home, you become, as it were, a member of the staff of a great New York newspaper. You are given actual assignments to cover. Your work is carefully read and edited at a copy desk, criticized and sent back to you.

Free test of Writing Aptitude

Our interesting Writing Aptitude Test insures you against wasting your time and money. Send for it—fill it out—return it. It tells us (and we tell you) whether you have the fundamental qualities necessary for writing success. No charge or obligation. Just fill out and send the coupon.

**Newspaper Institute of America
25 West 45th Street, New York**

Send me your Free Writing Aptitude Test and further information on Writing for Profit.

Mr.
Mrs.
Miss

Address.....

(All correspondence confidential. No salesmen will call on you.)
(10 E57)

5 ELECTRICAL Job Tickets

actually FREE!



to prove this home-training will prepare you for a good job and a raise in pay!

Get these five job-tickets. Look them over. Test your own ability to master Electricity at home in spare time. See for yourself how every fact has been simplified. See what thousands of men have paid millions of dollars for, to help them earn **BIGGER PAY**. Uncover some of the mysteries of Electricity, and see why millions of men are so fascinated by it. Don't send a penny, don't enroll — just mail the coupon.

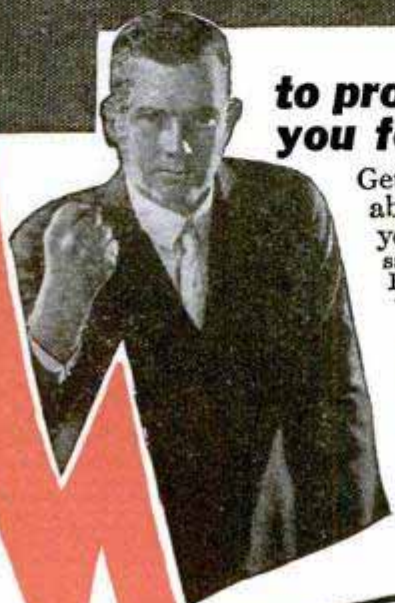
Go Into ELECTRICITY!

Thousands of jobs open at \$60 to \$125 a week. My training prepares you to fill them. Superintendents of Power Plants Wanted. Chief Electricians Wanted. Electrical Experts Wanted in Radio, Electrical factories, Auto Plants, Telephone and Telegraph Systems, etc.

Training Built by 29 Noted Engineers

This is not a one-man, one-idea school. 29 famous Engineers and Executives of the following corporations and universities helped me make Dunlap-training complete and up-to-date, /

1. General Electric Co.
 2. Commonwealth Edison
 3. Crocker-Wheeler Co.
 4. Cutler-Hammer
 5. American Tel. & Tel. Co.
 6. Westingh. El. & Mfg. Co.
 7. Western Electric Co.
 8. Underwriters Lab., Inc.
 9. Columbia University
 10. Dartmouth College
 11. Massachusetts Inst.
 12. Lehigh University
 13. University of Vermont
- AND MANY OTHERS



Your name here.....
When you enroll for my home-training in **ELECTRICITY** I agree to give you:

1. Complete training, including Electrical Engineering, Ignition; Radio, etc.
2. Seven outfits of standard tools and materials, including a \$10 motor.

3. I WILL HELP YOU GET A GOOD JOB AND A RAISE IN PAY,
4. —or I will refund every cent of your money.
By Chief Engineer Dunlap



AMERICAN SCHOOL
—the Million Dollar Educational Institution



Free Job Service!

for **STUDENTS** and **GRADUATES**. This **JOB SERVICE** keeps in touch with great Electrical employers all over America. The day you enroll, this Job-Service Department registers you, finds out what kind of job you want, where you want to work, etc. And when you apply for the job you want, we back you with our recommendation and help you make good in it after you get it.

WRITE Me Immediately!

If you have reached the point where you realize YOU MUST train and specialize to get anywhere, write me immediately! I will show you the wonderful opportunities, the enormous salaries, the many openings waiting in this billion dollar industry. I'll tell you about our sensational combination **TRAINING-AND-JOB** offer which practically assures your success. Mail coupon and get 5 Free Electrical Job-Tickets and complete information.

CHIEF ENGINEER DUNLAP, Electrical Division

AMERICAN SCHOOL Drexel Avenue and 58th Street
Dept. E-574 CHICAGO

I Will make this Contract with You!

Read it. This million dollar institution stands back of this agreement to **PREPARE** you to fill a well-paid Electrical Job, and then to help you **FIND** the job—or to refund the small amount charged for your training!

7 Costly Electrical Outfits Given!

I send you absolutely without extra cost, as a part of this training, 7 costly outfits of standard size tools and materials, so you learn Electricity **BY DOING** actual Electrical jobs. One of these outfits is a \$10 Electric Motor—a real motor and generator, the same type as the big fellows in a power plant. I send it to you "knockdown" and have you wind the field and armature and assemble it. *That's the way I teach every branch of Electricity!* House-wiring, Electric Light, Radio, and Motor outfits included.



\$10 Motor Given

5 Job Tickets actually FREE!

Chief Engineer Dunlap, Electrical Division
AMERICAN SCHOOL

Drexel Ave. & 58th St., Dept. E-574 CHICAGO

Send me your combination **TRAINING-AND-JOB** offer, 5 Free Job-Tickets, facts about opportunities in Electricity, etc.

Name _____

Address _____

Occupation _____ Age _____

MONEY TALKS



Mrs. Evalynn Balster

\$5,500 on First Deal

Mrs. Evalynn Balster, Chicago widow with 3 children, made \$5,500 on her first real estate deal.

\$28,000 in Six Months

Thos. Mone, Jr., Brooklyn insurance solicitor, sent for my free book and made \$28,000 in his first six months.



Thos. Mone, Jr.

In Massachusetts, Chas. F. Worthen read "How to Become a Real Estate Specialist" and earned \$8,500 in 17 weeks.

\$435 in One Day

F. B. Bennett, California lawyer, also followed my instructions. His first day in real estate netted him \$435.



H. D. Van Houten

H. D. Van Houten, New Jersey grocery clerk, sent for this free book, regained his health, built a \$100,000 business. All in 1 year.

\$8,000 in 90 Days

My free book took A. W. Fosgreen out of his candy store and into the real estate business. In 3 months he made \$8,000.



C. F. Worthen

W. E. Shoop, ex-Pennsylvania weaver, writes that he made \$6,000 on his first deal and has others pending.

\$1,300 in Two Hours

A copy of our free book reached Elden E. Mitchell, Florida baker. His first deal took two hours; brought him \$1300.



F. B. Bennett

In Michigan, Mrs. J. H. Hastings followed the advice of my free book; cleared \$248 on her first effort.



H. D. Van Houten

FREE

"How to Become a Real Estate SPECIALIST"

These are but a FEW of the THOUSANDS of similar cases reported to me by plain folks whom I have shown how to make big money. To learn how you—yourself—can use my new system of selling Real Estate—fill in and mail the coupon. You will then receive, without cost or obligation—my beautiful, illustrated book, which tells how I made \$100,000 in five years, how others are making really BIG money, and how YOU can make more money than you ever made before. Send the coupon NOW.

'American Business Builders, Inc. Authorized Capital \$500,000.00

Dept. 44 EE, 18 E. 18 St. New York, N. Y.

Send me, without cost or obligation your free book, "How to Become a Real Estate Specialist."



W. E. Shoop



Elden E. Mitchell



Mrs. Hastings

Name

Address

City State

Wrestling Book 10c

Learn at Home



Men, Boys be perfect physically. Learn right in your own home from **WORLD'S CHAMPIONS** how to be an expert **WRESTLER**. Learn secret trick holds, blocks, breaks and pinning holds. Learn how to defend yourself against bigger, stronger men. Learn Jiu-jitsu. Also most wonderful course in **PHYSICAL CULTURE** ever discovered. The world renowned **FARMER BURNS AND FRANK GOTCH** are authors of these splendid lessons. Learn to be a real athlete. You can if you'll try. Have a beautiful attractive body that all will admire. Surprise your friends, and the "bully" with your great ability. Learn to protect yourself, your mother, sister or sweetheart. Have perfect health, ability.

Only 10c

Send only 10c coin or stamps, for 32 page book, **ILLUSTRATED**, giving full particulars. Tells the secrets of the big Champions; gives many tricks, holds and other valuable information. A costly book which we send for only 10c—the cost of packing and postage. Don't miss it. Don't delay. **SEND TODAY—THIS MOMENT.** State your age. **Farmer Burns School, 1775 Railway Exchange Bldg., Omaha, Neb.**

30 Days' Free Trial on all MEAD Bicycles

Select from 44 Styles, colors and sizes. You can easily save \$10 to \$25 on your bicycle. Prices \$21.50 and up.

Factory to Rider Do business direct with the makers. We ship on approval for a month's free trial. **Rider Agents** make big money. Best quality, at factory prices. Lamps, wheels and equipment, low prices. **Send No Money,** do business direct with makers.

Mead CYCLE COMPANY Write today for free Catalog, factory prices and marvelous new offer.

DEPT. G-110 CHICAGO



YOU ARE NEEDED IN TRAFFIC INSPECTION



EARN UP TO \$250 PER MONTH Salary and Expenses

Trained men are needed to fill important positions in this fascinating and profitable railway work, sometimes called Traffic Observation. You'll be away from office or shop and practically your own boss—seeing new sights and places every minute. It's healthful, dignified work where you report only to high officials and are rapidly advanced.

No Previous Experience Necessary

For eight years, I have trained men for Traffic Inspection, and, upon completion of 3 months' spare time, home study course I helped them get good positions. Any man of normal intelligence can qualify, regardless of previous training. I will train you on the same basis, and upon completion assist you to a position paying at least \$120 per month salary plus expenses—or refund your money.

Traffic Inspection appeals to live men. It gives variety, independence and opportunity—gets them away from monotonous desk and dirty shop—gives them a chance to "be somebody."

Let me show you what Traffic Inspection holds for you. Send coupon today.

James T. Jarrel, Pres., Div. 2, Standard Business Training Inst., Buffalo, N. Y.

Standard Business Training Inst., Division No. 2, Buffalo, N. Y.

Yes, I'd like to know something about Traffic Inspection. Send me your free booklet "A Profession of Protection."

Name

Address



TRAVEL ON "UNCLE SAM'S" PAY ROLL

RAILWAY POSTAL CLERKS \$158 Month First Year

Raise to \$225 Month

Many other U. S. Government Jobs Open to Men and Boys 18 up

**Post Office Clerks
Rural Mail Carriers**

**City Mail Carriers
Clerks Customs and Internal Revenue Service**

These are steady positions. Strikes, poor business conditions, lockouts or politics do not affect them. U. S. Government employees get their pay for full twelve months every year. There is no such thing as "HARD TIMES" in the U. S. Government Service.

ALLOWANCE FOR HOTEL EXPENSES

Railway Postal Clerks now get \$1900 the first year, being paid on the first and fifteenth of each month. \$79.16 each pay day. Their pay is increased \$100 and \$150 a year. The maximum is \$2700 a year. \$112.50 each pay day. They get extra allowance for hotel expenses when away from home.

PAID VACATIONS

Railway Postal Clerks, like all Government employees, are given a yearly vacation of 15 working days (about 18 days). When on runs they usually work 3 days and have 3 days off duty or in the same proportion. During this off duty and vacation, their pay continues just as though they were working. When they grow old, they are retired with a pension. As Railway Postal Clerks are continually traveling, they have an excellent chance to see the country. They are furnished with a railroad pass.

City Mail Carriers—Post Office Clerks

Clerks and Carriers get \$1700 the first year regular and automatically increase \$100 a year to \$2100 with further increase to \$2300. They also have 15 days vacation. Examinations are frequently held in the larger cities. City residence is unnecessary.

What Will You Earn 5 Years from Now?

Compare these conditions with your present or your prospective condition, perhaps changing positions frequently, kicking around from post to pillar, no chance in sight for PERMANENT employment; frequently out of a position and the year's average salary very low. DO YOU EARN \$1900 EVERY YEAR? HAVE YOU ANY ASSURANCE THAT A FEW YEARS FROM NOW YOU WILL GET \$2700 OR MORE A YEAR, EVERY YEAR?



Get Free List of Positions

Fill out the coupon. Tear it off and mail it today—now, at once. DO IT NOW—This investment of two cents for a postage stamp may result in you getting a U. S. Government Job.

**FRANKLIN
INSTITUTE,
Dept. J-173
ROCHESTER,
N. Y.**

Rush to me entirely free of charge 32 page book with (1) a full description of the position checked below; (2) Specimen coaching; (3) a list of U. S. Government Jobs now obtainable.

Railway Postal Clerk (\$1900-\$2700)
Post Office Clerk (\$1700-\$2300)
City Mail Carrier (\$1700-\$2100)
Rural Mail Carrier (\$2100-\$3300)
Clerk in Government Offices . (\$1140-\$1860)
Bookkeeper (\$1320-\$2040)

Name

Address

Use This Coupon Before You Mislaid It—Write or Print Plainly

MAIL COUPON TODAY



\$60⁰⁰

Per Week!

Dear Mr. Dobe:—"I saw your advertisement, clipped the coupon and got started. Your course has already helped raise my salary to \$60.00 a week and in addition I get 50% of the profit on the construction of all buildings of which I am draftsman and general superintendent."

Phillip Zaroni

\$350⁰⁰

a Month!

Dear Mr. Dobe:—"I just recently jumped to the position of Chief Draftsman at \$350 per month. That's pretty good as I was a clerk making \$10.00 a week when I enrolled with you."

R. C. Foster



\$600⁰⁰ a Month

Wouldn't Tempt Him!

Dear Mr. Dobe:—"When I enrolled with you I was making \$3.20 per day. A short time ago I was offered a position to net me \$600 a month but it did not tempt me. I am in business for myself and wouldn't take a position at any price. I have a home worth \$19,000 and two automobiles. You can see what your course has meant to me."

Harold Dupree

Learned Drafting at Home!

Dupree, Zaroni and Foster are all products of the easy and quickly learned Dobe plan of teaching drafting at home. No other man uses the Dobe method. From Dobe you get real practical drafting work, keep the job you have now, stay right at home and in a few months you learn the great profession of drafting. No railroad fare, no board bill, no going to a distant city. If these men have been able to make the great success for which they give Dobe all the credit, how can you afford to pass up the chance? You can't!

Mail This Free Coupon or Write —Today for Free Book



They asked for the Free Book first. Will you ask for it today? Certainly you are not obligated at all by writing for "Successful Draftsmanship." Get it and read it. Then make up your mind how successful you can be. These men are making real money and you know the old adage "What man has done man can do." So mail the Free Coupon below—or write a letter or a post-card. Do that now. No man who is dissatisfied with what he is making now should fail to get and read "Successful Draftsmanship."

Dobe Easy Drafting

1951 Lawrence Ave., Div. 13-55 Chicago

You may send me free your book "Successful Draftsmanship" and names and addresses of more Dobe winners.

Name.....Age.....

Address.....

Post Office.....State.....

Music Lessons

UNDER MASTER TEACHERS

At Home

A Complete Conservatory Course by Mail

Wonderful home study music lessons under great American and European teachers. Endorsed by Paderewski. Master teachers guide and coach you. Lessons a marvel of simplicity and completeness.

The only recognized Conservatory of Music giving lessons by the UNIVERSITY EXTENSION METHOD.

The ideal of a genuine Conservatory of Music for home study based upon lessons containing the cream of the life's teaching experience of Master Musicians, reinforced by the individual instruction of specialists, is now attained.

The instruction of a master—the individual touch of an accomplished teacher—is yours to command from the very moment you enroll.

The University Extension Conservatory, by adopting the Personal Instruction Method, has placed home music study beyond question as to results. Anyone can learn at home.

Any Instrument Write telling us course you are interested in—Piano, Harmony, Voice, Public School Music, Violin, Cornet, Mandolin, Guitar, Banjo, or Reed Organ—and we will send our Free Catalog with details of course you want. Send now.

UNIVERSITY EXTENSION CONSERVATORY

387 Siegel-Myers Building

Chicago, Illinois

BE AN ARTIST

WE CAN TEACH YOU DRAWING in your own home during your spare time. Twenty-five years of successful teaching proves our ability. Artists receive large salaries.

Write Today for Art Year Book

SCHOOL OF APPLIED ART
ROOM NO. 2 BATTLE CREEK MICH.



Big Money in Poultry



Eggs Turn into Dollars FAST!

Make \$1,000 a Year in Spare Time—Easy

Lots of room for YOU in the poultry business. 85% of the people of this country live in cities. EVERYBODY eats eggs and poultry meat—but only 15% produce them. Why not let the "other fellow" pay YOU the fancy prices? Easy to get started in back yard, on vacant lot or farm. We GUARANTEE success if you follow our methods. We show you how to feed for eggs, in winter, when eggs are high in price; how to cut feed bills; how to keep flocks healthy; how to tell laying hens. PAY-BIRDS, from loafers. Our course, produced by eighteen famous experts, endorsed by 30 leading agricultural schools, gives you thousands of sure, proved, tested methods that make PROFITS CERTAIN. FREE book tells what we're doing for others—and what we can do for you.

Others Say:

"You have opened up to me a pleasant and profitable way of gaining an independent living."

Seldon Anderson, R.I.
"When I enrolled for your course, I knew nothing about poultry keeping. I am now successfully operating a commercial poultry farm."

W. J. Warthen, Conn.
"Your course was a splendid investment. I recommend it for both beginners and experienced poultrymen."

Y. W. Ow, Hawaii.

MAIL COUPON TODAY



Mail this now

The National Poultry Institute
Washington, D. C. Dept. 411

I am interested in your plan on "How to Raise Poultry for Profit." Send me your FREE book, without obligation on my part.

Name.....

Address.....

Summer IS COMING **FAST!**

— bringing thousands of

BIG-PAY AUTO JOBS

Train Now
at
GREER
COLLEGE

**Railroad Fare to Chicago
allowed—no extra cost**



\$6 a Day to \$20,000 a Year

is waiting for you in the auto business. Take your choice of jobs. The big season is right at hand. Just time to get your training at Greer College and **cash in**. Auto Repairmen make \$125 to \$250 a month. Head Auto Mechanic earns \$150 to \$500 per month. Auto Salesmen earn up to \$20,000 a year. Garage managers and owners make \$300 to \$5000 per month.

This is the opportunity for you if you like mechanical work.

FREE

Employment Service

Our employment department is ready to help you—while in training and for life. Day and evening classes. Low cost. Easy terms.

Act Now

Start now and get ready for these big money jobs. When you're trained you can go to work anywhere. Garages at big summer resorts will need help. Spend your summer where you want to.

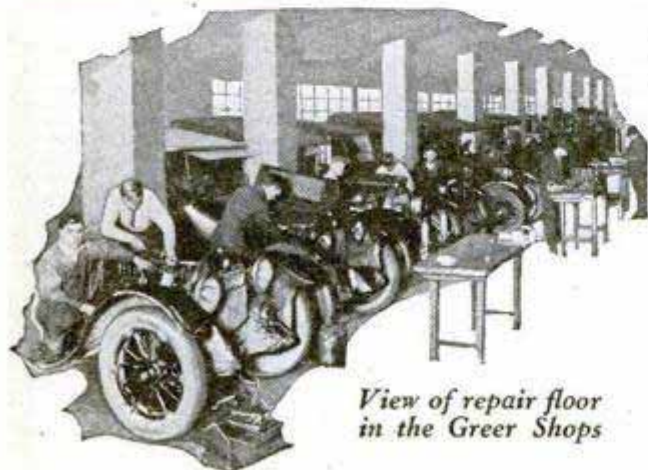
In the big Greer shops you are shown how to tackle any part of an auto. Always 75 to 100 autos, all makes, in our shops for actual repair work. You learn to do the same things here you'd be asked to do in any garage or repair shop—earning real money. Come to Chicago now. A great place to train. Thirty miles of beaches. One of the nation's great summer playgrounds. Training cost includes your railroad fare to Chicago. Write at once for the big **FREE Greer Book** giving all details. We help you select the right course, find lodging for you, and help find work for you if you need it. Mail the coupon **AT ONCE**. It brings all facts. Don't lose valuable time.

LEARN ELECTRICITY TOO

Take both courses and save 37½%

Another big Greer advantage. You can learn electricity while you learn about autos. Two courses combined in one at a big saving. The best electrical training equipment money can buy. Wonderful instructors. Everything made easy. Greer Shops have trained over 60,000 men for better jobs. Mail this coupon right now. Get our free book. Decide what we can do for you.

Greer College of Automotive Engineering
Dept. 501, 2024 S. Wabash Ave., Chicago



*View of repair floor
in the Greer Shops*

ERWIN GREER, President, Greer College—
Dept. 501, 2024 S. Wabash Ave., CHICAGO.

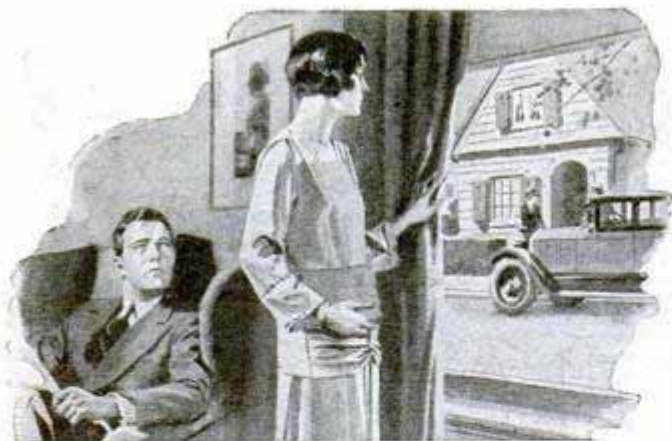
Please send me your **FREE BOOK** and offer for
It is understood I am not obligated in any way

Automotive ☐
Electrical ☐ course

Name

Address





"Why can't we have an automobile too?"

"THERE go the Nealls again—starting out for a week-end trip in their new car. Mary told me yesterday that they were going down to see Bob's mother in Cambridge to tell her about his latest promotion. He certainly has gone ahead fast since he started studying with the International Correspondence Schools."

"Why don't you take up the same kind of a course and show the firm that you're really trying to learn more about the business? I know you can earn more money if you really try."

Thousands of men now know the joy of happy, prosperous homes because they prepared themselves for advancement and increased salaries through the home-study courses of the International Correspondence Schools.

Can you afford to waste your time when it is so easy to get ahead? Can you afford to keep on putting in your days at the same old grind, getting the same pay envelope with the same insufficient sum, when a little grit and effort could be the means of changing your entire life?

One hour after supper each night, spent with the I. C. S. in the quiet of your home, will prepare you for success in the work you like best.

Put it up to us to prove it by marking and mailing the coupon printed below. It doesn't cost you a penny or obligate you in any way to do this, but it may be the means of changing your entire life.

Mail This Coupon for Free Booklet

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 5650-E, Scranton, Penna.

Without cost or obligation, please send me a copy of your booklet, "Who Wins and Why," and full particulars about the course before which I have marked X in the list below:

BUSINESS TRAINING COURSES

- | | |
|--|---|
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Industrial Management | <input type="checkbox"/> Advertising |
| <input type="checkbox"/> Personnel Organization | <input type="checkbox"/> Better Letters |
| <input type="checkbox"/> Traffic Management | <input type="checkbox"/> Show Card Lettering |
| <input type="checkbox"/> Business Law | <input type="checkbox"/> Stenography and Typing |
| <input type="checkbox"/> Banking and Banking Law | <input type="checkbox"/> English |
| <input type="checkbox"/> Accountancy (including C.P.A.) | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Nicholson Cost Accounting | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Common School Subjects |
| <input type="checkbox"/> Private Secretary | <input type="checkbox"/> High School Subjects |
| <input type="checkbox"/> Spanish <input type="checkbox"/> French | <input type="checkbox"/> Illustrating <input type="checkbox"/> Cartooning |

TECHNICAL AND INDUSTRIAL COURSES

- | | |
|---|--|
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Architect |
| <input type="checkbox"/> Electric Lighting | <input type="checkbox"/> Architects' Blueprints |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Contractor and Builder |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Architectural Draftsman |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Concrete Builder |
| <input type="checkbox"/> Railroad Positions | <input type="checkbox"/> Structural Engineer |
| <input type="checkbox"/> Gas Engine Operating | <input type="checkbox"/> Chemistry <input type="checkbox"/> Pharmacy |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Automobile Work |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Airplane Engines |
| <input type="checkbox"/> Metallurgy <input type="checkbox"/> Mining | <input type="checkbox"/> Agriculture <input type="checkbox"/> Navigation |
| <input type="checkbox"/> Steam Engineering | <input type="checkbox"/> Mathematics <input type="checkbox"/> Radio |

Name.....

Street Address.....

City..... State.....

Occupation.....

Persons residing in Canada should send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada



Have Fun Making Money

Yes, You Can—Anybody Can make a lot of money right at home and, what's more, have real fun doing it. We show you how, we furnish everything necessary on an easy basis.

Costs Nothing to learn about our plan, all details are given you free. Write today for beautifully illustrated idea book telling all about our methods which have made so many women independent. Learn how easy it is to make from ten to fifty dollars per week in the most delightful home work you can imagine. Don't miss this opportunity. **Write Now. It's FREE**

Fireside Industries
DEPT. 66-E • ADRIAN, MICH.



LEARN TO DRAW!

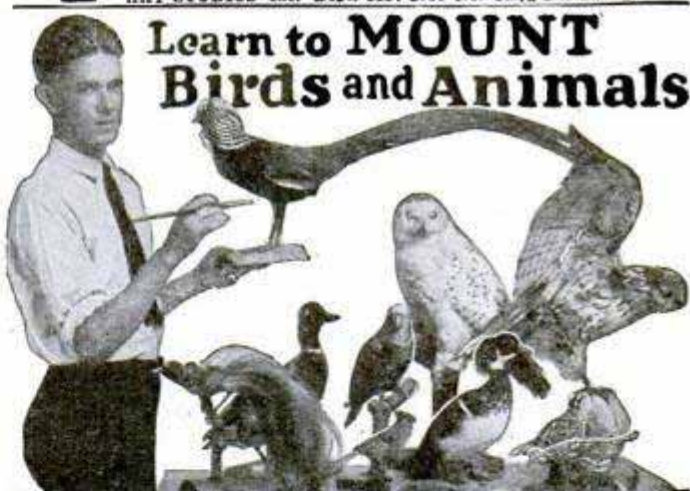
Remarkable book just off the press—"COMMERCIAL ART AND CARTOONING." Explains how to make illustrations for Books, Advertisements, etc. Also tells how to become a successful Cartoonist. **NO CORRESPONDENCE COURSE.** Everything complete in this book—14 chapters, over 125 illustrations. Tells about Elementary Drawing; Still Life; Pen, Ink, Charcoal and Crayon Work; Wash and Figure Drawing; Cartooning. Bound Flexible, Imitation Leather—Gold top. Worth \$5.00. Sent postpaid for \$2.00 (C. O. D. 17c extra). **OGILVIE PUB. CO., 57 Rose St., New York, Dept. 133.**



MAKE MUCH MONEY Making and Selling Your Own Goods. Formulas. Manufacturing Processes. Trade-Secrets. All Kinds. All Lines. Catalog, special circulars free. **W. THAXLY COMPANY, Washington, D. C.**

YOU CAN OIL PAINT

Amazing new method teaches men or women to earn after first lesson. **OIL PAINT** photos—portraits, landscapes or art subjects. Earn \$18 to \$50 and more a week. **OIL PAINT OUT-FIT GIVEN.** Send now for free illustrated book. **PICTORIAL ART STUDIOS Inc., Dept. MF, 2731 No. Clark St., Chicago**



Learn at Home by Mail

Be a taxidermist. Learn to mount BIRDS, ANIMALS, GAME HEADS, FISH. Wonderful fascinating new art. All secrets revealed. Easily, quickly learned by men, women and boys. Decorate home and den with nature's finest art. **SPORTSMEN** save your trophies. **BIG PROFITS** for spare time. Sell your mounted specimens and mount for others. Have a business of your own. Big demand, high prices. Learn from old reliable school, 20 years' experience.

FREE! Beautiful illustrated book, "How to Learn to Mount Game," with dozens of photos of mounted specimens. Yours for the asking—**FREE**—Write Today. Taxidermy is a **NECESSITY** for sportsmen and nature lovers—**INVESTIGATE.** Get this wonderful **FREE BOOK NOW**—no obligations. Send Coupon Today!

Northwestern School of Taxidermy
1775 Elwood Bldg. Omaha, Neb.
Send me your free illustrated book "How to Mount Game." Also tell me how I may learn this fascinating art easily and quickly by mail. No obligation.

FREE BOOK COUPON

Name.....

Address.....



Amazing New Shaving Invention MEANS...No More Blades to Buy

SHARP "new" blades every day! Keen, quick, velvety shaves forever! That's what this astonishing invention holds in store for you! Already it has revolutionized the before-breakfast habits of one million American men, and introduced them to shaving comfort and economy such as they had only dreamed of before!

KRISS-KROSS is capable of such extraordinary performance that it is hardly fair to call it a stropper. Rather it is a super-stropper or blade rejuvenator. It not only prolongs the life of a single blade for weeks and months—but it produces a keenness of edge that hitherto has been almost unknown! Actually you can take a blade right out of a fresh package and improve it beyond belief in 11 seconds with KRISS-KROSS!

Magic Diagonal Stroke

KRISS-KROSS possesses a mechanical ingenuity that is almost uncanny. It employs the famous diagonal stroke used by master barbers. Eight "lucky leather grooves" do the trick with an unfailing precision no human being can ever hope to

duplicate. Automatic pressure and reverse, too. The strokes commence heavy and gradually grow lighter and lighter—until a nickel jig flies up to notify you that your blade is ready with the keenest cutting edge that steel can take! No wonder legions of enthusiastic users are reporting as many as 365 slick shaves a year from a single blade!

Send for FREE Offer

KRISS-KROSS is sold by special representatives who will gladly demonstrate this remarkable invention for you without obligation. Right now they are authorized to make you an unusually generous introductory offer and are giving away a 3-way, adjustable razor entirely unlike anything you ever saw before! (See description at right.) If there is no representative in your neighborhood, you can secure the same generous offer direct from us. Use the coupon below for illustrated description and details. See for yourself exactly how uncanny and ingenious these two KRISS-KROSS inventions are. No obligation. Mail the coupon today!



3-Way Razor FREE

Most unusual razor ever invented. Really 3 razors in one. Instantly adjustable. Gives a sliding instead of pulling stroke. Simply zips right through the toughest crop of whiskers and leaves your face satin-smooth and cool. Comes with 5 special-process blades and is given FREE! Find out about it today!

AGENTS!

KRISS-KROSS offers excellent money to representatives and agents. Surprisingly generous commissions. Emil Ham of California made \$50 his very first day. J. C. Kellogg of Kansas made \$200 in 7 days spare time! Others are making \$75 to \$200 a week. Part-time workers often earn \$6-\$12 extra a day just showing KRISS-KROSS to friends and fellow employees. Find out about this great money-making opportunity at once. Check bottom of coupon for details! Mail it to-day!



KRISS KROSS

RHODES MFG. CO.
Dept. E-371
1418 Pendleton Ave.
St. Louis, Mo.

Stropper

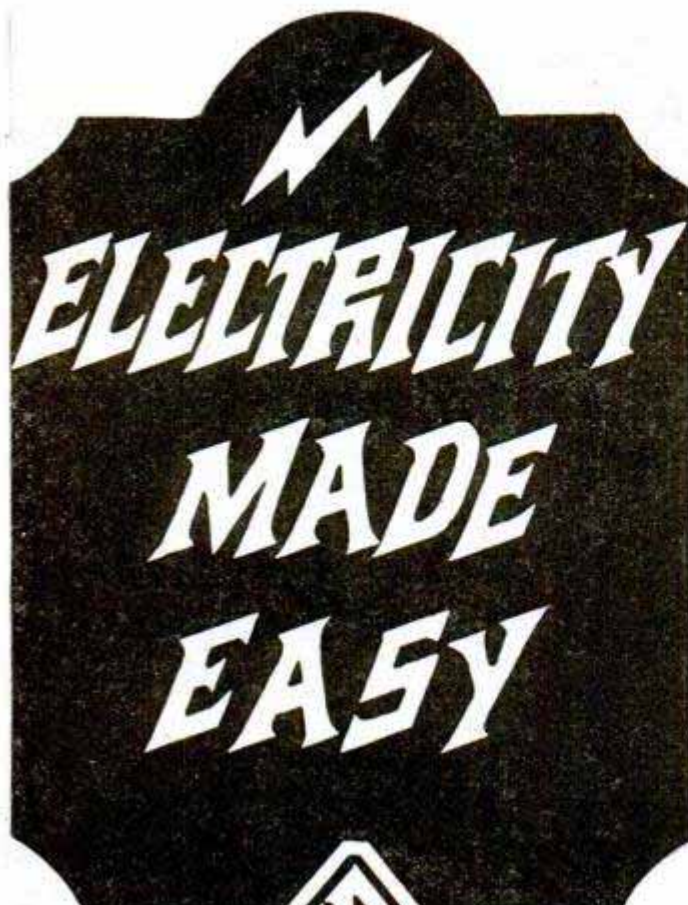
Rhodes Mfg. Co., Dept. E-371,
1418 Pendleton Ave., St. Louis, Mo.
Without obligation, please send me illustrated
description and full details of your special intro-
ductory offer on KRISS-KROSS super-stropper and
3-way razor GIVEN without extra charge.

Name.....

Address.....

Town..... State.....

() Check here if interested in making money as
authorized KRISS-KROSS representative.



The Big Opportunity for Men Who Like Electricity!



Actual Work with Actual Tools on Actual Equipment. The Coleman System enables you to learn quickly and easily. Instructors are all thorough, practical, electrical men.

They Tell You Why—They Show You How—They Have You Do It.

This system never fails when a student means business.

ALL ELECTRICAL SUBJECTS TAUGHT

House-wiring on skeleton house; armature-winding on real armatures; radio hook-ups on real sets; automobile electricity on live cars; motor repairing on D. C. and A. C. Motors; lead-burning and re-building on storage batteries right off the car; practical work and real "cashable" Knowledge; electric welding; electric refrigeration, ranges and household appliances; power plant work; power and light switchboards; automobile starting, lighting and ignition.

COLEMAN GRADUATES MAKE GOOD

No electrical job too hard for a Coleman graduate. Every man tested on all jobs before leaving school. His diploma is my certificate of his good work and dependability. Each man proves his own skill by real tests. He must stay on each training job until it is finished and the machine works.

BIG MONEY IN ELECTRICITY

Trained electricians earn \$200.00 to \$600.00 a month. \$320,000,000 paid in wages in U. S. to electrical workers last year. Your name should be on this pay-roll now. I will tell you how.

WRITE FOR FREE BOOK AND SPECIAL RATE

You will be surprised how quickly you can learn, and how low my tuition rates are.

WM. H. COLEMAN, President
COLEMAN ELECTRICAL SCHOOL
 1628B Main Street KANSAS CITY, MO.

CLIP AND MAIL THIS COUPON TODAY

Wm. H. Coleman, President,
 COLEMAN ELECTRICAL SCHOOL,
 1628B Main Street, Kansas City, Mo.

Dear Sir:

I want to learn about your school. Please send me free and postpaid your catalogue which will tell me how to get an electrical training at your special tuition price. This places me under no obligation.

NAME.....

ADDRESS.....

TOWN.....STATE.....



BEST TRADE BY FAR

Interior Decorating—House Painting—Paperhanging—Sign Painting—Show Card Writing—Graining and Marbling.

YEAR ROUND WORK AT BIG PAY

or start a business of your own. A few weeks' training at low cost will put you in the Big Pay Class.

Write today for big free catalog.

MR. BARR, c/o CHICAGO PAINTING SCHOOL
 144 W. AUSTIN AVENUE CHICAGO

LAW

STUDY AT HOME
 Become a lawyer. Legally trained men win high positions and big success in business and public life. Be independent. Greater opportunities now than ever before. Big corporations are headed by men with legal training. Earn \$5,000 to \$10,000 Annually.
 We guide you step by step. You can train at home during spare time. Degree of LL.B. conferred. LaSalle students found among practicing attorneys of every state. We furnish all text material, including fourteen-volume Law Library, Low cost, easy terms. Get our valuable 108-page "Law Guide" and "Evidence" books FREE. Send for them NOW.
 LaSalle Extension University, Dept 564-L Chicago
 The World's Largest Business Training Institution

"BECOME A LIGHTNING TRICK CARTOONIST"

Send \$1.00 for Laugh Producing Program of 23 Trick Drawings with Instructions. Catalog of Chalk Talk Supplies Free.
 BALDA ART SERVICE, Dept. 1, Oshkosh, Wis.

Learn Watchwork, Jewelrywork and Engraving A fine trade commanding a good salary, and your services always in demand. Address **Horological**, Dept. P, Bradley Institute, PEORIA, ILLINOIS, for our latest catalog.

ARE YOU BASHFUL?

You must overcome Bashfulness—Self Consciousness—Mental Fear—to succeed in the business and social world. Send 10c for amazing booklet, "Road to Poise and Achievement." Tells how thousands have conquered Bashfulness in a very short time.
 SEYMOUR INSTITUTE 38 Park Row Dept. 62 New York City

Genuine HAWAIIAN RADIO TONE GUITAR

GIVEN When You Enroll

New Short Easy-to-Play Course

One of the most efficient methods of instruction ever invented is now offered you.

You will understand it, instantly—Play Popular Music in Half an Hour

Your lessons come from lovely Hollywood, where the Stars learn to play the Hawaiian Radio-Tone Guitar. This fascinating instrument, brings you echoes of a far-off, dreamy, tropical isle.

You may now hear, that lingering, quavering one you have heard on the radio.

When you tune in on Hawaiian programs, it thrills you, makes you long to hear it again and again.

The Hawaiian-Radio Tone Guitar produces that wonderful, singing-humming tone you love. (It comes to you from Filmland, where it is broadcast nightly.)

Our Easy-to-Play Lessons teach you to produce the tone you desire so much to hear.

Native Hawaiian Teachers have worked out these simple lessons which reveal the secrets of their art.

SEND THIS COUPON NOW

Hawaiian Teachers of Hollywood, Studio 1A— Hollywood, California
 Please send me full information about your Free Hawaiian Radio-Tone Guitar

Name.....

Address.....

Learn How to BOX

JIMMY DeFOREST BOXING COURSE DEVELOPS CHAMPIONS BY MAIL

DeForest Boys are on the Road to Fame and Fortune!
The World's Most Famous Trainer Will Make You a Finished Boxer!



Read
What
Tasker
Says

Under the wonderful System of Jimmy DeForest, World's Leading Trainer and Developer of Champions, you will master the priceless knowledge that has made champions, and started hundreds of boys on the road to Fame and Fortune.

Jimmy DeForest teaches you all the fundamentals of boxing—right from the very ground up. His 35 years' experience is embodied in this marvelous System of Instruction—the identical methods which made more champions and real contenders for ring honors than any other trainer, either living or dead, ever created!

Every trick, every blow, every defense, every new angle in ring strategy that DeForest taught Dempsey, Firpo, Joe Gans, Kid McCoy and a host of others, is explained and illustrated in this one and only Complete Course in Boxing. Students testify that anyone can readily understand and master these simple as A B C instructions.

20 Weeks Is All It Takes

20 weeks will make you a finished DeForest-trained boxer—ready to take your place along with the best of the lads who are real drawing cards for bouts at big fights. Soon thereafter, by applying the principles you have been taught, your name will rank as one of the clever boxers in your locality. DeForest-trained boys who were unheard of a year ago, are now fast approaching championship titles, and several of them are actual contenders. Novices in the beginning, they are top-notchers now!

Opportunities Simply Unlimited

See what Geo. Tasker, of Rumford, Me., did. Until he took the DeForest Course he never won a contest in his life. "Since then," he writes, "I have engaged in nine contests, winning all

but one, which I lost on a close newspaper decision." Tasker is only one of scores whom the DeForest Course has put on the road to Fame and Fortune. The same opportunity is knocking at YOUR door. Grasp it NOW, on the eve of the biggest boom in the history of Boxing. Promoters all over America are clamoring for new material. They are constantly asking us to recommend good boys—boys with fighting hearts. Are you that kind of a lad?

Weaklings have been made strong and men physically rebuilt, energy, strength and courage developed. Prominent men and leaders in all walks of life, including Prof. T. W. Seeley, famous Physical Culturist, box regularly to keep themselves fit! It will be a revelation to you.

Send for This Gripping Book

Send today for this now famous book, "The Golden Age of Boxing," the most remarkable volume of its kind ever written, full of valuable information, photos of great boxers and pupils who became successes overnight. It contains a complete outline of the DeForest Course, week by week, with special picture charts used in most of the lessons. This book will thrill you and open your eyes to the marvelous opportunity that lies before you. Who knows but what your life's fortune is right in the signing of that coupon below? Enclose 10c to cover mailing cost, etc.



Jimmy DeForest Boxing Course
347 Madison Ave., New York City

Jimmy DeForest Boxing Course,
347 Madison Ave., Box 618, New York City.

Without cost or obligation on my part, please send me your book "The Golden Age of Boxing."

Name

Street No.

City State

DRAW CARTOONS

TURN YOUR TALENT INTO MONEY

Cartoonists earn from \$50 to \$300 per week—some even more. Remarkable new Circle System of Drawing teaches you in half the usual time. Send for booklet and sample lesson plate explaining full details of the Course.

The National School of Cartooning, 623 Penton Bldg., Cleveland, Ohio



AT HOME LEARN TELEGRAPHY AT HOME

TEACH YOURSELF

in half usual time, at trifling cost, with the wonderful Automatic Transmitter, **THE OMNIGRAPH**. Sends unlimited Morse or Continental messages, at any speed, just as an expert operator would. Adopted by U. S. Government, and leading Universities, Colleges and Telegraph Schools. Catalog 6 cents.

OMNIGRAPH MFG. CO., 13-19 Hudson St., NEW YORK



\$25 to \$100
for single
drawings

Learn to Draw at Home

this quick easy-way

Trained artists make \$50 to \$200 a week. The demand for good artists is always increasing. Magazines, Newspapers, Advertisers and Printing Houses pay big prices for drawings, designs, illustrations, cartoons, etc.

Prepare now for this fascinating, high-paying profession. Quick, easy method teaches you designing, drawing, illustrating, and cartooning right at home, in spare time. You receive personal corrections and helpful suggestions from experienced art instructors on all of your drawings.

SEND FOR FREE BOOK

Free Book tells all about our method and how to make money in this big paying field. Write today for Free Book and details of our Attractive Offer. Mail postcard or letter NOW. No obligation. **WASHINGTON SCHOOL OF ART, Room 305-E, 1115-15th Street, N. W., Washington, D. C.**

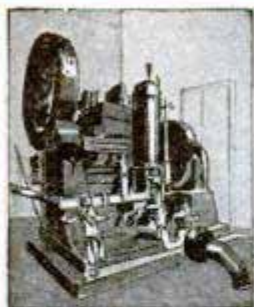
O. C.
MILLER

Director
Extension
Work
American
School



The American School

A million Dollar No-Profit Educational Institution, now offers men a *double* service—training for a specific job, then help in finding the job. For one small price, on terms of only \$5.00 a month, you are now assured of definite benefits, both in position and salary. Write for complete information—today!



No machine can be built until the Draftsman first builds it on paper. My training prepares you for this work.



Never has the world seen anything like the building boom of today. This has created enormous demand for real Draftsmen.

5 BIG-PAY Branches

The big money in Drafting goes to men who specialize in Machine Design, or Electrical Drafting, or Architectural Drafting, or Structural, or Automotive. It is not enough merely to know general Drafting practice. You must know how to calculate and design and plan original work. You need many Engineering subjects to fill the kind of a Drafting position that pays \$60 to \$125 a week. The American School now includes this specialized training in its Drafting course.

Costly Drafting Outfit Given!

Fine, imported instruments like these help you learn Drafting quickly and easily. These standard quality, full size instruments, board, table, triangles, T square, ink, protractor, etc., given to every student without extra cost.

O. C. Miller, Director Extension Work

The American School

Drafting

to prove you can

We have invented a new, simplified way to teach Drafting—the first real improvement in Drafting home instruction in history. We want you to see a few of these new Job-lessons, try them, test your own ability to master them—without one penny of cost or obligation. For instance, you will see how we get away from the “copying” methods used in the past, so you develop into a DRAFTSMAN, instead of a “tracer.” See for yourself the ingenious new method which compels you to think, to solve problems, to do actual Drafting-room jobs from the very first lesson!

A New, Rapid, Simplified Training

Copying drafting lessons prepares you to be only a “tracer.” This new “Job-Method” gives you actual drafting-room jobs in a new one-step-at-a-time way. With pictures which you can understand almost without reading the “lessons.” And that is why the American School-trained Draftsmen can qualify for a good job at big pay when they graduate.

Win Success Thru Drafting

Drafting is easy, fascinating work. Short hours. Big pay. And the Draftsman is always in line for promotion to executive positions. This training is complete. It includes high school subjects (if you need them) and all the Engineering and Mathematics Drafting experts require.



FREE Job Service!

The American School now offers its students and graduates, without cost, the services of an efficient employment department keeping in constant touch with employers of Draftsmen all over the U. S. We have placed hundreds of men in good, big-pay Drafting positions. We've made this training so complete, so practical, so easy to master, that our students are bound to make good. And so, because the demand for real Draftsmen continues to exceed the supply and because this training actually prepares men for good Drafting positions we back it with a Free Employment Service.

Dept. D-574

Drexel Avenue and
58th St., CHICAGO

Lessons *Actually* FREE

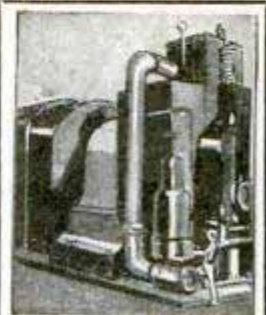
learn at home in spare time!

Draftsmen Wanted!

\$60 to \$125 a Week!

yourself. Plan your future in Drafting. Even if you have only common schooling, even if you know nothing of Drafting, we guarantee to make you a real Draftsman or to refund your money! Special surprise offer right now to the first 500 men who answer this ad—reduced price, easy terms. Coupon brings complete information.

70,000 fine jobs advertised last year. Get ready to fill one. Get out of the rut. Make something of



Electricity needs Draftsmen who know Electrical principles as well as general Drafting practice. I give you this training.



The demand for Draftsmen experienced in concrete and structural steel work is enormous. Many big-pay positions open.



Every great Auto factory employs Draftsmen who specialize in Automotive work — men who design bodies, plan engines, etc.

I Will Make This Contract With You



American School
—the Million Dollar
Educational Institution



WHEN you enroll for our home-training in Drafting, we agree to give you:

1. Complete Drafting training, by the new Practice-Method.
2. Professional Drafting Outfit, as illustrated.
3. We will help you get a good Drafting position at a substantial increase in pay,

4. or we'll refund every cent of your money.

O. C. Miller
Director Extension Work

Coupon Brings 3 Lessons FREE!

Read These Letters!

City of Chicago
Department of Buildings
Gentlemen: The same day I received my diploma I got word that I was one of the two candidates who had successfully passed the examination for Deputy Commissioner of Buildings of the City of Chicago, a position paying \$3600 per year.

There were eight applicants examined besides myself, all men well known to the architectural and engineering profession. Seven of these failed to obtain a passing grade of 70%. My grade was 84.69.

Inasmuch as I failed to pass this same examination three years before, my present success is mainly due to the knowledge gained through your School.

Yours very truly,
ROBERT KNIGHT

Got His Draftsman's Job

"I wanted to let you know how I came out in getting that job at the Brownell Co., Dayton, Ohio. I was to start and have a trial at Drawing, and I am still in the Drawing room. The engineer seems to like the work I make, and also the other draftsmen. I thank the School very much for getting me in at this place, because your letter of recommendation helped me a whole lot to get the job."

BERNARD WEBER,
730 St. Nicholas Ave., Dayton, O.

Liberty High School Bethlehem, Pa.

Dear Sirs:—This is to thank the American School for all that you have done for me since I signed up for the Drafting and Design Course.

In the eight years since then, I have gradually climbed from the position of tracer to that of Head of the Department of Machine Drawing and Design in our magnificent new \$2,000,000 High School here, at many times the salary which I received at that time.

The officials of the Pennsylvania State Department, and Dr. Wm. C. Ash of the University of Pennsylvania, all claim that our course in Drafting and Design is the best now being taught in this state. Every drafting graduate that we have turned out has proved successful, and one is now Chief Draftsman in a local steel concern. Yours sincerely,

J. S. LEAR

Has Charge of Large Jobs

"Even before I had finished my course, I was put in charge of large construction jobs in different cities. I have been doing that ever since, and the jobs are getting larger all the time. I owe my success to the American School because of the knowledge I gained in mathematics and calculations."

ELMER L. LAMB,
1306 Smith St., Peoria, Ill.

Get them. Test your own ability to learn Drafting and get ready for a fine job and big pay.

Coupon also brings surprise offer, and complete information about your opportunities for success in Drafting. Mail It Today!

3 Drafting Lessons *Actually* FREE

O. C. MILLER, Director Extension Work
AMERICAN SCHOOL

Dept. D-574, Drexel Ave. and 58th St., Chicago.

Rush 3 Free Drafting Lessons, Job and Raise Offer, complete information, money-back guarantee, etc., to prove I can become a real Draftsman at home in spare time.

Name

Street No.

City State



Follow this Man

Secret Service Operator 38 is on the job

FOLLOW him through all the excitement of his chase of the counterfeit gang. See how a crafty operator works. Telltale finger prints on the lamp stand in the murdered girl's room! The detective's cigarette case is handled by the unsuspecting gangster, and a great mystery is solved. Better than fiction. It's true, every word of it. No obligation. Just send the coupon and get—

FREE!

**The Confidential Reports
No. 38 Made to His Chief**

And the best part of it all is this. It may open your eyes to the great future for YOU as a highly paid Finger Print Expert. More men are needed right now. This school has taken men just like you and trained them for high official positions. This is the kind of work you would like. Days full of excitement. Big salaries. Rewards.

Can you meet this test?

Can you read and write? Are you ambitious? Would you give 30 minutes a day of your spare time preparing yourself for this profession? Would you like a life of excitement, thrilling adventures and high pay? Answer "yes" and I'll show you how to attain all this.

Send the coupon and I'll send the Free Reports—also a wonderful illustrated book telling of the future awaiting you as a Finger Print Expert.

T. G. COOKE, Pres.

UNIVERSITY OF APPLIED SCIENCE
1920 Sunnyside Ave., Dept. 13-55 Chicago, Ill.

University of Applied Science
1920 Sunnyside Ave., Dept. 13-55. Chicago, Ill.

Gentlemen:—Without any obligation whatever, send me the Reports of Operator No. 38, also your illustrated Free Book on Finger Prints and your offer of a FREE course in Secret Service Intelligence and the Free Professional Finger Print Outfit.

Name.....
Address.....
Age.....

ELECTRICITY

Practical-Technical TRAINING

Great demand for practical-technical electricians and engineers. A brilliant future awaits you. A high salaried position or a profitable business of your own; these may be yours through our PRACTICAL-TECHNICAL courses. Opportunities unlimited.

Finlay condensed method now in 25th successful year trains head and hand. Thousands of high salaried graduates throughout the world testify to the success of Finlay training. Extensively equipped laboratories and shops. Faculty of recognized experts. One and Two Year courses in Electrical Engineering open in September; 12 Weeks courses in Practical Electricity and Power Plant Operation open at any time. Degrees, diplomas and certificates of efficiency awarded. Students assisted to positions.

SEND
FOR
FREE
CATALOG

FINLAY ENGINEERING COLLEGE Fall term starts September 15th
119 Finlay Bldg. Kansas City, Mo.

Does Your English Help or Hurt You?

Wonderful new way to improve your English. No rules to learn. No hard study. Grammar, spelling, punctuation, and expression, taught in 15 minutes a day—at home. Self-correcting feature makes it fascinating as a game. Write today for Free Book "How to Speak and Write Masterly English." Address

SHERWIN CODY SCHOOL OF ENGLISH
55 Searle Building Rochester, N. Y.



A Great Book Free with this pay-raising library

For a short time only we will give every subscriber to the New Library of Machine Shop Practice a copy of French's Engineering Drawing—the greatest book on mechanical drawing ever written. This book makes drawing as plain as day—tells you all about instruments, plans and methods—and prepares you to handle any drawing job you will ever have to do. It comes to you absolutely free with

Machine Shop Practice

9 volumes—3065 pages—3608 illustrations
(A combined home study course and reference library)

The New Machine Shop Library is written for practical men. It gives you the best methods for every kind of machine shop work. It explains machine tools and their operation, drawing and design, tool work, gears and grinding, jigs and fixtures, automatic screw machines and their tools and all of the mathematics you will ever have to use. It is plainly written, completely illustrated—the very best kind of help to the machine-shop man who wants to advance himself.

Sent

**No money down—
only 7c
a day**

FREE



FREE EXAMINATION COUPON

McGRAW-HILL BOOK CO., Inc., 370 Seventh Ave., New York
Send me for 10 days' free examination the New Library of Machine Shop Practice. If satisfactory, I will send you \$1.50 in 10 days and \$2.00 monthly until the special price of \$19.50 is paid. If not wanted, I will return the books at your expense.

On receipt of my first payment of \$1.50, it is understood that I am to receive, free of charge, a copy of French's Engineering Drawing.

Signed.....

Address.....

City and State.....

Position.....

Employer..... P.M. 5-1-27

How do
you dare
to say
"I have no
opportunity"
?



L. J. McATEE, Pres. & Mgr.

GEORGE W. CLASON, V. Pres. & Supt.

FREEMAN JENSEN, Sec. - Treas.

Phone Max. 1200



27 E. Boone Ave.

SPOKANE, WASH.

LaSalle Extension University,
Chicago, Illinois.

Gentlemen:

When I first considered training with LaSalle, I believed I was fully trained in the fundamentals of the laundry business, yet I realized that I lacked the broader business training which would permit me to take my place among the leaders of that industry.

I do not remember just what salary I was receiving, but I may say that my income is several hundred percent greater than when I enrolled five years ago, and it is still increasing. I am a stockholder in the company, its vice-president, and its superintendent.

More appreciated even than the increased income is the personal confidence and knowledge I have gained. For now I know that I know business thoroughly and that I can make good anywhere.

Very sincerely,

G. W. Clason

Vice-President.

IF at 14 you had left school—and at 19 your job had been to take care of the horses in the barn of a laundry—would you consider you had got away to a particularly favorable start?

"Never mind," said G. W. Clason, face to face with this situation, "I'll make my opportunity right where I am!"

So he learned the laundry business from barn to office, and at 28 was operating a plant of his own. When fire wiped his business out, he rebuilt and started again. Unable to finance himself properly—*thru lack of business understanding*, as he testifies—he sold out and took a position as superintendent of the Ideal Laundry Company, Spokane, Washington.

Right then he made up his mind to remedy his lack—and enrolled with LaSalle for training in Business Management.

Today, at 47, he is vice-president and director of this big and successful company, owns a substantial interest, and commands an income several times as large as when he started with LaSalle five years ago.

"I give all credit for my success to my LaSalle training," writes Mr. Clason. "It has proved by far the most profitable investment I ever made."

Start to Make Your Opportunities Today

You are eager to succeed in some special field of business. Do you know your opportunities?

You will find them clearly described in a 64-page book which LaSalle will send you free, together with a free copy of "Ten Years' Promotion in One."

You are *in earnest*? You are really determined to increase your income and insure your business progress? Fill out, clip and mail the coupon NOW.

Find Yourself Thru LaSalle!



LASALLE EXTENSION UNIVERSITY, Dept. 564-R CHICAGO

I shall be glad to have your 64-page booklet about the business field I have checked below. Also a copy of "Ten Years' Promotion in One," all without obligation.

- | | |
|---|--|
| <input type="checkbox"/> Higher Accountancy | <input type="checkbox"/> Traffic Management—Foreign and Domestic |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Railway Station Management |
| <input type="checkbox"/> Modern Salesmanship | <input type="checkbox"/> Banking and Finance |
| <input type="checkbox"/> Law; Degree of LL. B. | <input type="checkbox"/> Personnel Management |
| <input type="checkbox"/> Commercial Law | <input type="checkbox"/> Modern Business Correspondence and Practice |
| <input type="checkbox"/> C. P. A. Coaching for Advanced Accountants | <input type="checkbox"/> Expert Bookkeeping |
| <input type="checkbox"/> Effective Speaking | <input type="checkbox"/> Business English |
| <input type="checkbox"/> Modern Foremanship | <input type="checkbox"/> Commercial Spanish |
| <input type="checkbox"/> Industrial Management | |

Name.....

Present Position.....

Street.....

City.....

State.....

these books free

For **BIG PAY** get into **ELECTRICITY**

"Cooke" TRAINING BRINGS

**\$ 3,500 to
\$ 10,000 a year
to Thousands**



BIG PAY! You've thought about it and you've dreamed about it—now why not make up your mind to get it? You can! Electricity is looking for men like you. With "Cooke" training there's no telling how much you can make. Thousands are earning \$3,500 to \$10,000 a year!



Big Demand For Trained Men On Jobs Like This!

BIG PAY for Men Everywhere

My now famous Work-Sheet and Job-Ticket Method is helping men everywhere to win big-pay Electrical jobs. For "Cooke" training is RIGHT training—simplified, thorough instruction along practical work-shop lines. It is HOME training—you learn during your spare hours. And it is SUCCESS training—an opportunity never before equalled to become an Electrical Expert and make three or four times the money you do now.

Extra Dollars During Spare Hours

And you can make money almost from the very start. With the five Big Outfits of tools and equipment I furnish, most of my "boys" earn extra dollars during their spare time. After the first few lessons I show them how to get this work, how to do it, what to charge. In this way they pay for the Course and put money in the bank besides. Think of making \$15 to \$25 "on the side" every week while learning, without interfering with your regular job!

Only Grade Schooling—But BIG PAY Just the Same

Why not begin right now? No special schooling is necessary. Not one in ten "Cooke" trained men had more than a common school education. But today they are in the Big Money class. Electricity, with thousands of Big-Pay jobs to be filled, opened the door to opportunity—and "Cooke" training enabled them to step in and make good. \$70, \$85, \$100, yes, \$200 a week—such incomes go to "Cooke" trained men! And this same training is now offered you.

Get Started—Mail the Coupon

I want to send you my big Electrical Book—the book that has raised the pay of thousands of men hundreds of dollars a month. It's free, so send for it today. Then you will know why the "Cooke" trained man is the Big-Pay Man—why Electricity needs you and is willing to pay well to get you. Fill in and mail the coupon now.

L. L. COOKE, Chief Engineer

L. L. COOKE SCHOOL of ELECTRICITY

Formerly known as Chicago Engineering Works, Inc.



**Now Gets
\$100 a Week**
"Dear Chief:
When I enrolled
with you was
just a \$10 a week
soda clerk. Long
before I gradu-
ated I was a
maintenance
man at 150%
more pay. Now
my weekly earn-
ings are around
\$100." Ralph
P. Cronaore,
Greencastle, Ind.



**From \$25 to
\$200 a Week**
"Dear Mr.
Cooke: In two
years time my
weekly earnings
have increased
from \$25 to
around \$200,
and your Train-
ing gets all the
credit. Now I
am specializing
in motor instal-
lation and on
the road to a
great success."
George W.
Schnupp, 315
East New Street,
Lancaster, Pa.

**I will
train
You at
HOME**

**5 BIG
Outfits
given to you—
No extra
charge**



**Secrets of
Success in
ELECTRICITY**

FREE BOOK COUPON--MAIL IT!

**Chief Engineer Cooke,
Dept. 15, 2150 Lawrence Ave.,
Chicago, Illinois.**

You may send me, entirely free and fully prepaid, your book, "Secrets of Success in Electricity," together with particulars about your Home Study Course in Electricity.

Name

Address

City State

Residents of Canada send coupon to R. A. Farrow, Special Representative,
7 Medbury Lane, East, Ont., Canada.

The "Cooke" Trained Man is the "Big Pay" Man

Classified Advertisements

WORLD'S BEST WANT AD MEDIUM

Advertisements in this section, 30 cents per word, each insertion, minimum 10 words, payable in advance. To be inserted under proper classification in June issue, copy should be in our office April 18th.

ADVERTISING AGENCIES

ADVERTISERS: Amazing growth made by one of our clients, who started last May with \$1.20 weekly. Now spending \$500.00 weekly. Name furnished on request. We'll help you put your proposition over. Cash in on our thirty years of experience. Copy and literature composing service free. Your 24 word ad inserted in the following ten leading Sunday papers for only \$10.00: Age-Herald, Birmingham; Gazette, Little Rock; Star, Indianapolis; Journal, Minneapolis; Star, Kansas City; World-Herald, Omaha; Courier, Buffalo; Enquirer, Cincinnati; Gazette-Times, Pittsburgh; Banner, Nashville. Proof of insertion guaranteed or money refunded. 52 page rate book sent free. Frank W. Lenhoff Advertising Agency (Established 1897), 600 North Michigan Blvd., Chicago. Chicago's most progressive agency.

A TEN Dollar Ad may put your proposition over. \$10 pays for a 4 line 24 word classified ad one Sunday in 9 of the largest newspapers. Reach over 6 million readers. Minneapolis Tribune, Buffalo Courier, St. Louis Post-Dispatch, Pittsburgh Press, Indianapolis Star, Atlanta Journal, Birmingham News, Cincinnati Enquirer, Little Rock Gazette. Free catalogue showing other lists of newspapers and magazines sent on request. Ankrum Advertising Agency, 22 West Jackson Blvd., Chicago. Largest classified advertising agency in the world.

ADVERTISE in the classified section of newspapers and magazines, to secure help, money, or to sell. 24-word advertisement in nine big Metropolitan papers \$10.00. Nearly two million circulation. Many other bargain lists. Write for Free 58-page Directory No. 26. Brinckerhoff Advertising Agency, 37 W. VanBuren, Chicago.

ADVERTISE in 24 Big Sunday Newspapers, 24 words \$15.00. Excellent for securing Agents, Salesmen, and Business Opportunities. Catalog listing 1,000 leading Dailies, Weeklies, Mail Order Magazines. Everything. Free. Wade Advertising, Baltimore Bldg., Chicago.

NEWSPAPER — Magazine advertising — Classified, mailorder, Catalog. Martin, 276B West 43rd, New York.

SIX Word Line—355 rural weeklies \$3.55. Admeyer, 4112-M Hartford, St. Louis.

FOR ADVERTISERS

36-WORD ad in 18 of the leading daily and Sunday papers for \$5.00 for 3 months; \$10, six months, etc. We get results. Mack Advertisement Co., Box 354, Lake Worth, Fla.

ADVERTISE in 275 country newspapers, 28 words, \$10. Keator, Hartford Bldg., Chicago.

25 WORDS 88 magazines; \$1.00. Thrice \$2.00. Smith's Service, 1194, Wenatchee, Wash.

CUTS Engraved. Lowest prices. Wineholt Sales Co., Woodbine, 4, Penna.

40 WORDS insert 60 magazines \$2.00. Empire Agency, Shawano, Wis.

ADVERTISERS' Manual, summer edition, inside information, postpaid 50c. Economics Co., 1475P Broadway, New York.

ADVERTISE for profit in Porter's Magazine or Postal Success. Information. Porter, 9416a, 115th St., Richmond Hill, N. Y.

CUTS, Drawings \$1.50. Window Cartoons, 6, \$1.50. GPO, Bx471, New York.

ENDLESS orders without advertising. Guaranteed plan \$1.00. Any desired formula \$1.00. Popular Institute, AP-430, Milwaukee Ave., Chicago.

SALES PROMOTION

\$50 TO \$50,000 Daily Sales Developed During 28 years for clients by our direct mail plans, copy, campaigns. One product, 1923, an idea; this year \$100,000 orders booked. Fifty year old concern desired 50 national representatives in 1925; we produced 40 in three months. 700 dealers in 10 months at \$3 each, for another. Ten years Sales Promotion Manager Larkin Co. Submit sales problems for Free diagnosis. James C. Johnson, 118A Woodbridge Ave., Buffalo.

AUTOMOBILE SUPPLIES

SAVE 40-80%. New and Used Automotive Parts, 2,000 models. Bankrupt supplies, 5,000 bargains. Sport shields, \$5.00, roadster tops, \$10.00, complete touring, \$15.00. Wheels, radiators, generators. Brightman Auto Exchange, 321 Windsor Ave., Hartford, Conn.

TIRE-S: Save retailer's profit. 30x3 1/2 cords, \$5.50; red tubes, \$1.15; 29x4 balloons, \$7.25; red tubes, \$1.40. Postpaid. Send money order or personal check. New, high standard makes; guaranteed. All firsts. Request list other sizes. Lowest prices in U. S. A. Georgia Wholesale Tire Company, Statesboro, Ga.

AUTOMOBILE Owners, ignition supplies at half price. Absolutely new. Tungsten contacts, distributor caps, rotors, condensers, resistances, and everything pertaining to electrical equipment of automobiles. Ted Davis Electric Co., 913 Forty-Ninth St., Brooklyn.

NEW Idea eliminates headlight glare. Two sample pair by mail \$1 bill. Literature free. Reynolds Glare Eliminator, Madison, S. Dak.

WHOLESALE Prices on Tire and Battery Shop Equipment and Supplies. Send for catalog and state what business you are interested in. Adams-Barr, Columbus, Ohio.

YOU are wanted to resilver mirrors at home. Immense profits, plating auto parts, headlights, tableware, stoves, etc. Outfits furnished. Write for information. Sprinkle, Plater, 77, Marlon, Ind.

FIVE minutes accomplishes hour's work. Wonderful invention for auto, radio and other difficult work. Retails \$1. Just show; sold! American-Simplex Co., Anderson, Ind.

VULCANIZING Auto Tires is a Paying Business. We have Plants near you from \$50 up. Catalog Free. Instruction Book \$1. Equipment Exchange, 108 East 11th, Los Angeles, Calif.

MAGNETOS, Starters, Generators, Ignition systems, spark plugs, part, timing chains, repairing. Meinert Magneto Co., 1759 E. 21st St., Cleveland, Ohio.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, CI-805, Wheaton, Ill.

AUTO Emblems. Any Lodge. Write. North Central Distributors, Dept. J, Ashland, Ohio.

TRUCK Owners — Stop shoveling, dump your loads. Dependable Hoist Co., Streator, Ill.

AUTOMOBILES

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

DYKE'S Automobile Encyclopedia. Latest 14th edition. Information on repairing and adjusting every part of all motor cars. How to find trouble and fix it. Send no money. Pay postman the postage and \$6. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

753 TIME, Labor and Money Saving Ideas for all who own, drive or repair autos. These practical hints are based upon the actual experiences of hundreds of owners and repairmen. Three books, Auto Owners, Auto Repairman's and Auto Tourists Handbooks, regular \$1.50 value from Popular Mechanics Press will be supplied at 98c, plus the postage C. O. D. for a limited time only. Send your order today to Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago.

AUTOMOBILE SERVICE EQUIPMENT

NESTLER Rubber Pusing Outfit, with shop tools, instructions, etc. This plant will repair or retread any size tire. Will sell reasonable. Roy B. Hutchason, Olney, Ill.

BATTERY Charger for sale. One day constant potential type—best known make on the market—with full equipment necessary to charge all kinds of batteries. You'll be surprised at the low price. Write me today for full details. Ira C. Helmick, Box M-574, Troy, Ohio.

AIR Compressor bargains. 1/2 h.p. to 1 1/2 h.p. Upright style being adopted by leading oil companies because of space saving, beltless, single unit design. Also few horizontal models and low pressure outfits for paint spraying. D. C. Jenkins, Box M-573, Troy, Ohio.

ELECTRICAL Test Bench with equipment for testing all electrical units of any automobile. Made by leading manufacturer of battery and electric shop equipment. My price on this will surprise you. E. C. Galbreath, Box M-575, Troy, Ohio.

FOR FORD OWNERS

PUT a "Bingo Timer" on your Ford. Guaranteed best made. Thousands in use. Requires no oil. No more trouble. All dealers or direct with full particulars—\$1.50. Agents make big money. United Machinery Company, Cincinnati, U. S. A.

UNDERSLUNG with "RKO" Swing Lo Irons. See "Red-i-Kut" ad page 135.

FORD Sport Bodies; underslung fixtures; overhead valves; closing out; inspected. Detroit, 647 W. 50th, New York.

OUR Improved Vibrator Points make Ford engines start easy. \$1 postpaid. S. D. Brown, 198 South St., Newburgh, N. Y.

SIMPLEX Mechanical Starter. All Fords—especially trucks. Easily attached. Guaranteed. \$10. American-Simplex Co., Anderson, Ind.

FORD Racing Body. Full size patterns and instructions, \$2. J. Taylor, Phi Delta Theta, University, Va.

POWER Tire Pumps for Fords. Clagett Mfg. Co., Marlboro, Md.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, CI-805, Wheaton, Ill.

FORD Electrical Equipment Troubles— Locate and remedy them easily yourself with the aid of our book "Ford Standard Electrical Equipment." Why pay big garage bills? Battery, ignition, starting and lighting covered. Order today. When postman hands you the package pay him \$1.98 and the postage. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago.

MOTORCYCLES, BICYCLES AND SUPPLIES

OVERSTOCKED Used Motorcycles. 1923 Indian Chief \$95.00, 1923 Harley Davidson \$95.00, 1923 Henderson DeLuxe \$120.00. Two hundred others; write for free list. Myerow Brothers Co., 15 Berkeley St., Boston, Mass.

MONEY Saving Motorcycle Bargains— Large stock of Used Harley-Davidson—\$50 and up. Send for Free bargain bulletin—Now! Motorcycle Parts, accessories, repairs for all makes. Knuth's Harley-Davidson Agency, 2525 Fond Du Lac Ave., Milwaukee, Wis.

RENEWED Harley Davidson Motorcycles. Unconditionally guaranteed. Attractive prices. Send for free list. Heinz Motor Co., 611 W. North Ave., Baltimore, Md. Harley Davidson Distributors.

INDIAN motorcycles \$50. Standard models \$10. Deposit with order, balance C. O. D. Stern Bros., 1790 1st Ave., New York City.

HARLEY Davidson demonstrator, condition perfect, looks guaranteed good as new \$190. R. E. Haesly, Winona, Minn.

MOTORCYCLE Bargains. Used, rebuilt. Guaranteed. Shipped on approval. Catalog free. Floyd Clymer, 810 Broadway, Denver, Colo.

SEND stamp for Bargain Bulletin. All makes rebuilt motorcycles at lowest prices. Used parts half price. Ash Motor Corporation, Rochester, N. Y.

REBUILT Indian Motorcycles, lowest prices. Used motorcycle parts. Hurck Indian Co., 2127 Locust, St. Louis, Mo.

NEW and used Motor Cycle Parts. Tower Cycle Co., 3604 Kingsland Ave., Pine Lawn, Mo.

NEW and used motorcycles and parts. Write for price bulletin. Arnold Motor Co., Joplin, Mo.

DON'T buy a Bicycle Motor Attachment until you get our prices. Shaw Mfg. Co., Dept. 27, Galesburg, Kans.

AUTOMOBILE—Make your own motor car, toy size, operated with motorcycle engine. Any boy can make it. Costs little aside from engine. Full directions with drawings an dimensions in The Boy Mechanic, Book 3. Send no money. Pay postman postage and \$2. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

AVIATION

LEARN to Fly! \$100.00 including Solo. We guarantee to solo you regardless of the number of flying hours required. Our instructors are ex-army aviators and air-mail pilots with wide experience. Our training equipment is the best obtainable. Our course requires about two weeks, depending on the individual. No bond required, no charge for breakage. Eight years without an accident. 76 students graduated in 1925. Commercial aviation is a rapid growing industry. Don't delay! Enroll now in one of the oldest and best known flying schools in America. Write for booklet. Robertson Aircraft Corporation, operators of the United States Air Mail, St. Louis-Chicago, Lambert-St. Louis Airport, Anglum, Mo.

LEARN Aviation the Watson-Way—Complete course—flying, construction, assembly, repair and maintenance of plane and motor. New method of teaching aviation. All under direct supervision of Lieut. Hugh Watson, flying instructor during the war and a leading commercial aviator for the past ten years. Various makes of modern planes, good location, splendid flying field. No specified number of hours. Write now for complete information. Watson Airport Co., Blue Ash (Cincinnati), Ohio.

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

TEN Lessons in the air of twenty minutes each will make you a pilot by our advanced method of training. This, together with our five weeks shop course, at \$100.00, makes America's oldest aircraft factory the most popular flying school. Work after class hours guaranteed. Special summer evening course, including shop work, field and flying, \$185.00. Employment assistance on jobs paying \$18.00 to \$40.00 per week. Heath Airplane Company, Chicago, Ill.

SEND One Dollar. We will send you by return mail a beautiful pair of sterling silver wings mounted on bar pin with safety catch, also identification card issued by National Flyers Assn. These pins are being worn by thousands of aviators, aviation mechanics and boosters. Wallace Aero Co., Bettendorf, Iowa.

THE American School of Aviation announces a new correspondence course in Mechanics of Aviation. A thorough training in Practical Aeronautics. American School of Aviation, Dept. 1861, 3601 Michigan Ave., Chicago, Ill.

AIRPLANE Supplies wholesale prices; genuine leather helmets \$1.95 up; aviator goggles 70c to \$7.50; new propellers, 8" \$3.50; flying suits with insignia, \$9.50; new TM Wings, \$15.00. Air Transport, Carle Place, New York.

THE Age of the Air is Here. For reliable information on both airplane building and flying we recommend "Aeroplane Construction and Operation," by Rathbun. All features of construction treated. Send no money. Pay postman \$2.50 and postage. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

TRAINING in building, designing, and flying under the builders of the famous King Bird Airplane. Age must be over sixteen. Wake up. Better yourself. Aviation is booming. Write today. Dept. K-5, Western Airplane Corp., Monadnock Bldg., Chicago.

TWIN Cylinder motorcycle engines, rebuilt for aero-drive boats, \$25 to \$50, complete with propeller. Propeller hubs \$5. Send 4c for details. Sensenich Brothers, Lititz, Pa.

\$188.00 BUYS all parts, including assembled wings, to build the new Heath "Parasol" sport plane, using motorcycle engine. Simplest to construct. Safest to fly. \$575.00 ready to fly away. Write for circular. Heath Airplane Company, Chicago, Ill.

AERONAUTICS! "Aeroplane engines in Theory and Practice," by Rathbun, describes engines fully. Includes all makes. For mechanic, builder and flyer. Send no money. Just order on a postal. When postman hands you book, pay him \$2.50 and postage charges. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

AIRPLANES. Send for free cuts, and plans of our wonderful two place, companion type, small, high lift wing monoplane, and information how to build this ship, and be sure it will fly, also propeller literature. Crawford Airplane Mfg., 2225 American Ave., Long Beach, Calif.

SEND dime for 12 inch mounted propeller and circulars on free three foot model aeroplane. No selling. Aero Shop, 3050 Hurlbut Ave., Detroit, Mich.

RIGGEST, Best Catalog Model Airplanes, Parts Supplies; 5c postpaid. Ideal Company, 165 1/2 Spring Street, New York.

CURTIS Ox5, and radiator, \$75. C. Irwin, Eau Gallie, Fla.

BOOKS AND PERIODICALS

EVERY Thinking man and woman should read "The People's Industrial System." This 32-page book tells about a system that aims to be a complete, practical solution to many of the problems in which every human being is interested; a system that will abolish poverty and the fear of poverty; that will guarantee to everyone an opportunity to earn a living at all times, and to have time for the development of a worth-while life. Solves the labor problem, the money problem, the race problem, the crime problem. Will do away with the danger of violent revolution. Can be established quickly by a comparatively few people, without voting, without changing laws, without disturbing existing system or business concerns. Will make life a real pleasure, as it should be. Get this book by sending \$1 (which will be returned if you request it) to the author, Sheridan Webster, 506 Market St., St. Louis, Mo.

WHAT Subjects Interest You? Select from this list of helpful worth while books. Social Letters Made Easy, Spelling Made Easy, How to Develop Your Will Power, Tricks and Magic Made Easy, Bookkeeping Made Easy, Chemistry for Beginners, How to Work Your Way Through College, Confidential Chats with Boys. Price \$1.25 per volume. Pay postman price and postage when he hands you the package. Address Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago.

POST Office stamp clerks need our 120 page, pocket size, book, "Federal" computing tables, to get exact value of odd lots of stamped envelopes. Hundreds used by inspectors and postmasters. Two dollars postpaid. Investors Company, 808 Century Bldg., Milwaukee, Wis.

BEST Book Opposing Evolution \$1.50. First edition \$1.00. Best essays 10c. S. O. Bryant, Bethany, Mo.

GREAT Opportunity Book. Contains money-making plans, formulas, secrets. Real information. Postpaid \$1.00. Particulars free. National K-6113 Chandler, Cincinnati, Ohio.

"COLOR Mixing Guide" \$1.00—Book stores. Fine Arts Pub. Co., 2033 College, Indianapolis, Ind.

WHERE'D Cain Get Wife? 15 pages 20c. Jabe Studio, Kansas City, Mo.

ANSWERS to mathematical problems of office, store, shop, bank, farm or factory. Explains and simplifies every principle of arithmetic, mechanics and mensuration. Send no money. Just ask for "Ropp's Calculator." Pay postman \$1 and postage. Popular Mechanics Press, 200 E. Ontario St., Room 905, Chicago, Ill.

HYPNOTISM—25 easy lessons and 248 page illustrated reference guide, \$2.00. Popular Institute, 430PM, Milwaukee Ave., Chicago.

FORTUNE-TELLING and Dream Book, big 66-page size, 25c. G. Elsea, Bowling Green, Ohio.

DRAFTING. Learn Mechanical Drawing. Big demand for men. Pocket size. Start at beginning and learn by a series of simple lessons. Send no money. Just write postal for "Practical Course in Mechanical Drawing." Pay postman postage and \$1. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

CURIOUS Books, Unique Novelties, Stunning Pictures. Samples, 10 cents prepaid. Linds, 214 W. 34th Street, New York.

ARCHKO Volume dollar postpaid. Holmes Book, Sixth St., Los Angeles, Calif.

FORGED decorative articles. Andirons, fireplaces, scroll and grille work, lamps, candle sticks, coat hangers, knockers and other hand-forged decorative articles can be made with instructions in new printing of "Hand Forging," by Thomas F. Googerty. Profusely illustrated. Send no money. Write a postal asking for Hand Forging. Pay postman postage and \$2.00. Popular Mechanics Press, Room 905, 200 East Ontario St., Chicago, Ill.

PICTURES AND POSTCARDS

VIEWS in natural colors. Thirty views, City of Detroit; twenty-two views of Belle Isle Park; twenty views, Ford plant, world's largest; twenty views of Detroit's largest industries and hotels. Each folder size 4x6 in. Mention views wanted. Price each folder 10c. Atlas View Co., Dept. A, Box 681, Detroit, Mich.

TRUE-BLUE friends everywhere. Exchange postcards, stamps, etc. Membership, 25c. Club book, hundreds listings, 10c. Ericson, Elroy, Wis.

125 CARD tricks, 25c. Catalog free. Wineholt Sales Co., Woodbine, D4, Penna.

JOIN Live Postcard club. Membership Lists including Catalog 10c. Harvey Teeple, Decatur, Ind.

ART PICTURES, Books and Novelties. Catalog 10c. Howard Sales Co., Dept. 15, 1188 Folsom St., San Francisco, Calif.

SEND 20c stamps for pocket novelty. Best yet. Lists included. "Agency," Box 47, Brantford, Ontario.

GAMES, ENTERTAINMENTS AND PLAYS

PLAYS, musical comedies and revues, minstrel music, blackface skits, vaudeville acts, monologs, dialogs, recitations, entertainments, musical readings, stage handbooks, make-up goods. Big catalog free. T. S. Denison & Co., 623 S. Wabash, Dept. 11, Chicago.

100 LIGHTNING Chalk Talk Stunts \$2.00. Cartoonist, 2925 Euclid, Kansas City, Mo.

VENTRILOQUISM taught almost anyone at home. Small cost. Send 2c stamp today for particulars and proof. George W. Smith, Room S-171, 125 N. Jefferson Ave., Peoria, Ill.

CHALK-TALK your way to popularity. Audiences at your feet if you learn how to entertain with a few simple pictures. Little artistic ability needed. "How to Chalk Talk" tells what to say and what to draw. Profusely illustrated. Make \$1 and more a night. Send no money. Just order on a postal. Pay postman \$1.00 and postage. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

MAGIC TRICKS, BOOKS AND JOKER NOVELTIES

MAGIC—Tricks, Books and Supplies. For Amateurs as well as the great professionals. Anyone can learn through our instructions. Feature Acts in Mind-Reading, Spiritualism, Rope Ties, etc. Large illustrated Professional Catalog, 20c. Chicago Magic Co., 140 So. Dearborn St., Dept. B, Chicago, Ill.

NEW Sensational Wrist Shackle Escape only 85c complete. Wonderful bargains in other tricks and illusions. Catalogs free. Sample trick 10c. F. & R. Co., Dept. F, Hoboken, N. J.

FOR something different, send 10c for "Fun-Magic-Mystery." New 80-page Book of 500 Tricks. Also contains Catalog largest line Magic Tricks and Supplies in South, at lowest prices. Send 10c today! Lyle Douglas, Station A, Dallas, Texas.

SEVEN Magical Delusions and Catalogs—25c. Gilmagic, Morgan Park, Ill.

CARD Tricks, Coin Tricks, Hypnotism, Ventriloquism. 64 page books, complete guides, 10c each. Geo. Fenner, 2401 Jefferson, Louisville, Ky.

MAGIC Trick Cards That Are Absolutely guaranteed. Free samples. Write me today. C. D. Blankenship, Adrian, W. Va.

ESCAPE from Sacks, Rope Ties and Chains. Easy with these complete instructions. Give an evening's entertainment and mystify the "wise ones." Let them tie you hand and foot, place you in a bag and seal the bag. In a minute you are out. Complete instructions in "33 Rope Ties" and "Sack Escapes." Send no money. Pay postman \$1.50 and postal charges for these two books. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

MAGIC Bargain: Thurston's Book of Magic with clever mechanical card trick for 25c coin. Walter Gibson, 709 Chestnut St., Philadelphia, Pa.

ELECTRIC Fun! Seventy stunts, 110 volts, \$1. Tacutting, Campbell, Calif.

MAGICAL Mysteries—Stunning Tricks, Perplexing Puzzles, Books, Entertaining Novelties. Catalog Free. Schembri, Box 1124, Detroit, Mich.

FREE with \$25 order die box. Send 20c for our large catalogue of tricks, wigs, sensational escapes. Oaks Magical Co., Dept. 548, Oshkosh, Wis.

ELECTRIC Fun! Seventy stunts, 110 volts, \$1. Tacutting, Campbell, Calif.

ILLUSTRATED Magic Catalog 7c. Lynn's, 105 Beach, Jersey City, N. J.

READ Sealed Messages in Dark; messages retained by audience; burned message appears on blank slate; spirit message appears on slate in sifter's presence; spirit rappings; spirits appear in the dark; answer questions written on folded papers while blindfolded. All this you can do with directions in "Behind the Scenes with The Mediums," 69 best secrets of mediums fully exposed. The best because most baffling, yet all easy to do. Send no money. Just write a postal. Pay postman \$1.50 and postal charges. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

NOVELTIES, CURIOS, ETC.

LATEST Importation, 19-in. Telescope cigarette holder 60c. Four-in-one pen, pencil, cigarette holder, dice, 75c; all for \$1.25 postpaid. Special offer to agents. Globe Supply Co., Duluth, Minn.

STAMP COLLECTING

JUST what every stamp collector wants—Free! The new 1927 Scott Price List is just out, brimming full of wonderful bargains. Hundreds of Scott Seald packets, sets, and dime sets of guaranteed genuine stamps. Many attractive new packets and sets that every collector, advanced or beginning, should know about. Prices that make every item a real bargain. Also describes the complete line of Scott Albums, from 60c to \$55.00; catalogues, hinges, tongs, magnifying glasses, watermark detectors, millimeter scale and perforation gauge and all other accessories needed by the collector. This big illustrated price list of more than 80 pages is free for the asking. Write for it now. Scott Stamp & Coin Co., 1 West 47th Street, New York, N. Y.

500 DIFFERENT Stamps for 25c! Big Collection 500 Different Stamps from Bosnia-Herzegovina, Crete, Epirus, Hong Kong, Ireland, Kenya and Uganda, Liberia, Malta, Nyassa, Tanganyika, Wallis and Futuna, Zanzibar, and other "hard" countries. Catalogue value \$10.00. Price only 25c to Approval Applicants! Special Bargains: 1,000 different 79c; 15 triangle stamps 49c; 100 Africa 50c; 100 Asia 60c; 100 Balkan States 35c; 100 British Colonies 25c; 100 French Colonies, 30c; 100 Portuguese Colonies 50c; All 8 packets for \$3.00! Illustrated Lists Free. Loma Stamp Co., 2221 Madison Ave., San Diego, Calif.

MYSTIC'S "Queer Country" Packet! Contains scarce stamps from the following strange lands: San Marino, Antioquia, Congo, Cyprus, Fiji Islands, Gwallor, Hyderabad, Iceland, Jhind, Kenya, Uganda, Lebanon, Monaco, North Borneo, Nyassa, St. Thomas Prince, Port, Guinea, Siam, Sierra Leone, Tanganyika, Trinidad Tobago, Ubangi, Upper Volta, Wallis Futuna, Zanzibar. Get this wonderful packet of "freak countries" and make your friends envious! Price only 10c to approval applicants! Write today. Mystic Stamp Company (Dept. 8), Camden, New York.

ANCHERS \$\$\$ Outfit—only 12c! Fine triangle stamp; set German stamps with (pre-war) value forty million dollars (interesting!); perforation gauge, mm. scale; small album; airmail set; scarce stamp from small republic on earth; newspaper set; packet good stamps from Travancore, Johore, Dutch Indies, etc. Entire outfit for 12c to approval applicants! (Nice pocket stock book, value 25c, with every order!) Anchor Stamp Co., 148½ Clerk St., Jersey City, N. J.

ANNIVERSARY Offer! Seven following sets: "Anniversary," "Jubilee," "Charity," "Airmail," "Eagles," "Prisoners," "Pic-nics." Four of following packets: (British, French, Dutch Colonies), (Precancelled), (Bulgaria), (International) 15c to approval applicants. Deering, Fairmount, Marlborough, Mass.

\$1.00 FREE. Black U. S. Postage, Given Away with each order. Pioneer Stamp Album with 500 illustrations, 150 different stamps from 40 countries, Syria, Lebanon, Hejaz, Liberia, New French Colonies, British, Portuguese Colonies, South Africa, Australia, 500 hinges, 36 page illustrated catalogue. All for 13c. Big Commission to Agents for the Best approval sheets of stamps ever offered. Write for sample outfit. Hussman Stamp Co., Dept. M, 620 Olive St., St. Louis, Mo.

NEWFOUNDLAND Stamp Bargains! 63 Scott's varieties \$5.00; 33 for \$1.00; 25 for 25c. Illustrated Catalogue 10c. Rev. Butler, St. Georges, Newfoundland.

EUROPE Collection, 19th Century. Fine condition, over \$7,000.00 catalogue. Price \$4000.00. Also Mint Collection, German Colonies complete. High values, sheets of twenty. Catalogue \$6300.00, price \$5000.00. Carl Hackert, 332 East 87th St. New York City, N. Y.

CANADIAN—25 different only 10c and asking to see our Excellent Approvals; receive Beautiful Confederation Jubilee stamp, 5 Newfoundland and Bargain Lists free. Victoria Stamp Co., London, Canada.

MOST Sensational values; over 140 diff. Algeria, Airplanes, Azerbaijan, Barbadoes, Cameroun, Gabon, Guyane, Irish set, large French Colony packet, largest stamp, 40 year old U. S., gauge, etc., for 10c to approval applicants. List free. 100 diff. U. S. 25c—1,000 hinges 9c—50 Bavaria 7c. Hawkeye Stamp Co., Cedar Rapids, 39, Iowa.

TO approval applicants enclosing 10c for our Marvel Packet of 55 different from Gabon, Togo, etc., we will send—absolutely free—a genuine scarce South African triangle stamp! Curhan Stamp Co., Gloucester, Mass.

105 CHINA, etc. 2c. Album (500 illustrations) 3c. Bullard, Sta. A. Boston.

STAMPS sent on approval at 70% discount. Reference required. Emory Renoll, Hanover, Pa.

UNITED STATES—Send on approval. Send me your want list. Ref. Please. M. Hanna, New Kensington, Pa.

FOREIGN Revenues, Telegraphs, Locals, envelopes, rails, etc. pretty, different, cheap. Stamped Marine Policy free to applicants with references. Vanderhoof, 1114 Logan, Denver, Colo.

200 DIFFERENT stamps 10c; 1,000 Hinges 10c. R. H. Carlton, 380 W. So. Temple, Salt Lake, Utah.

APPROVAL Books on any country at 50% and 25% discount. Special packets and sets with premiums. Send for lists. Noemus Stamp Co., 312 East 23rd St., New York.

110 NEW Europe All Different, a wonderful collection cataloguing several dollars, free to collectors requesting our Net Approvals. Postage 2 cents. Badger Stamp Co., Milwaukee, Wis.

FREE Hungary Charity No. 565 to 567 and a surprise packet given to those requesting for my 1, 2, and 3c approvals, and also my 50% discount. Chas. W. Schmidt, P. O. Box 4832, Frankford Station, Philadelphia, Pa.

BEST One cent approvals in America. P. P. Hand, 1117 So. 60th St., Philadelphia, Pa.

BORNEO, Malay, Liberia, large U. S. revenue, commemoratives, with 105 other different U. S. and foreign stamps for only 9c. Fennell Stamp Co., Dept. M, St. Louis, Mo.

SET Mozambique 15 beautiful stamps 10c, 25 diff. airmail, 20c. Hanisch Stamp Co., Sixth St., Racine, Wis.

50 DIFFERENT Danzig 30c. List free. Stamps on approval. Hollub, Deland, Fla.

100 FOREIGN Postage Stamps for 4 cents postage, together with handsome stamp wallet offer and approvals. Lists free. Palmer Stamp Co., 8221 Linwood Ave., Detroit, Mich.

100 DIFFERENT, Arabia, Azerbaijan, Zanzibar, etc., 10c to approval applicants. Floyd Marsh, 524 Hamilton Ave., Indianapolis, Ind.

TRIANGLE Stamps—10 different, 25c; 15 different, 40c; 25 different, \$1.00. Royal Stamp Company, 620 Matagorda, San Antonio, Tex.

VERY Special—500 different 25c. Ask for price lists and approvals. Cleveland Stamp Co., Caxton Bldg., Cleveland, Ohio.

STAMPS on approval at one-third Scott's catalog prices. 25,000 different. References required. Tubbs, 4043 First St., San Diego, Calif.

ZANZIBAR, Abyssinia, Travancore, Mozambique, Quelimane, Menagerie Collection, Album, 10c. Liberty, 3974 Arsenal, St. Louis, Mo.

110 DIFFERENT Stamps, many unused, high values, free to collectors requesting our Net Approvals. Postage 2 cents. Christensen, Milwaukee, Wis.

200 DIFFERENT Stamps, Abyssinia, Liberia, Egypt, Bulgaria, China, Chile, etc.; illustrated list and approvals, only 10 cents. W. Mikkelsen Co., 4029 Grace St., Chicago, Ill.

FREE: Packet of imported hinges, to approval applicants for our stamps-in-sets. Wonder value packet, 97 varieties of stamps. Catalog \$4.10, for only 25c. Guaranteed to please. S. Kahn Co., Inc., Ardmore, Okla.

SPLENDIFEROUS Premium, 50-70% approval applicants furnishing references. Bland, 311 Fayette, Pekin, Ill.

APPROVALS 36,000 varieties. Beginners, United States, British Colonials, Precancelled at low net prices. Send references. Fine premiums, lists, auctions. Ye Olde Hobbie Shoppe, Port Huron, Mich.

FINEST One cent approvals in the United States. Stanton, Natick, Conn.

FREE Premium to new approval customers. Reference. Valley Stamp Company, 3123 Texas Ave., St. Louis, Mo.

500 DIFFERENT Foreign \$10. Catalog for classy stamps 19c; with pretty approvals. 1011 diff. cat. \$25, for 69c. Rotnem Stamp Co., 809 N. W. Bldg., Minneapolis, Minn.

"PRECANCELS," 100 mounted 25c; 1000 bulk \$1.50. Pettet Bros., 960 Boulevard S. E., Atlanta, Ga.

200 DIFFERENT Stamps from Dutch Indies, Canada, Newfoundland, etc., to approval applicants, price 12c. Hinges 10c per 1000. Stamp Box, 165, Tremont St., Boston, Mass.

ONE Dollar catalog value free with first purchase of \$1.00 net from my popular approvals. Better class of stamps for those willing to spend \$1.00 or more at a time. References please. A. Bauer, Palmyra, N. J.

500 DIFFERENT, 35c; 350 different, 25c; 200 different, 12c; 500 mixed, 18c. Evans, Box 364, Reading, Pa.

44 STAMPS from 44 different countries, 4c. Lists free. Harold Shepard, Hyattsville, Md.

TRIANGLES! 10 different, 25c; 15 different, 40c; 25 different, \$1; 50 different including rarities, \$3.95. Free! with all orders, 12 scarce Azerbaijan or set South Africa just issued. Pennsylvania Stamp Co., Greensburg, Pa.

UNITED States and foreign approval sheets for beginners; booklets by countries for the more advanced. Everything for collectors, sets, packets, albums, hinges, etc. A stock of 40,000 varieties to select from. Reference please. Old Colony Stamp Co., 333 Washington St., Boston, Mass.

200—200—200—200—ALL different stamps; 200 hinges; approval sheet to hold 200 stamps; perforation gauge, millimeter scale and ruler; duplicate stamp container, all for only 15c to approval applicants. Edgewood Stamp Company, Milford, Conn.

35 BABADOS, 50c; 50 British Guiana, 35c. Craven Stamp Co., Thompsonville, Conn.

1,000 ALL different stamps \$1.00. New price list of all United States stamps free. Voorhees, 7 South Dearborn St., Chicago.

1,000 DIFFERENT Fine Stamps, 69 cents. Approvals. Kenilworth Stamp Co., Ridgewood, N. J.

100 FINE mixed, U. S.-B. C. precancelled. Best Flag History, all \$1.00. Edmund Bigelow, Lockport, Ill.

50 DIFFERENT South Central American, 15c; 100, 45c; 200, \$1.10. Fred Onken, 630 79th St., Brooklyn.

STAMPS, 100 varieties, Africa, Brazil, Peru, Cuba, Mexico, etc., 10c; 25 different U. S., 25c; 1,000 mixed, 40c; 1,000 hinges, 10c. List free. C. Stegman, 5941 Cote Brilliante, St. Louis Mo.

LIBERIA Snake Triangle and two other triangles in our packet of 53 genuine foreign stamps for five cents. Crowder Company, Waverly, Baltimore, Md.

FREE—Twenty-five different stamps, your choice with approvals at one-half cent each. Three hundred stamps to select from, British and French colonies, South American, Asia and European countries. J. F. Kollard, 351 E. 33d St., New York City.

MAGNIFICARCTIOUS Packet foreign stamps, beauties from distant lands. (Many richly colored, unusual designs) free for 2c. Gray Stamp Company, Toronto, Canada.

BUY collections without purchasing duplicates. Write Farley Stamp Co., Auburn-dale, Mass.

TRIANGLES! 75% discount—Special approval sheets with each 5c packet containing set triangles. 2 sets war tax, set airplane, U. S. stamp before 1880, etc.; over 100 different stamps. Murray Stamp Co., 515A Tower Bldg., St. Louis.

1000 JAYHAWK mixture, 25c. Jayhawk Stamp Company, Topeka, Kans.

SPECIAL: Liberia "Snake" Triangles, Nyassa Pictorial Triangles, Morocco Airmail and our "Famous Foreign Packet" containing Azerbaijan, Odessa Hunger Issue, Albania, Armenia, etc., only 10c to approval applicants. Flower City Stamp Co., St. Thomas, Ontario.

BRUNEI, 3 var. 8c., postpaid. Lists free. Allison, Angola, Ind.

300 **VARIETIES** penny approvals, many countries. References necessary. Ogden Stamp Shop, Baldwinville, N. Y.

PENNY Approvals that Satisfy. Nell Gronberg, Box 5441, Philadelphia, Pa.

108 **STAMPS**, Chad, etc., album, 4c to approval applicants. Hill, Leonard St., Waltham, Mass.

FREE 100 different stamps to approval applicants. Postage 2c. C. H. Tempe, 1310 S. Gaffey, San Pedro, Calif.

100 **STAMPS** from 30 Countries, 5c. Lufbery, Port Orange, Fla.

FINE Approval Selections at 60% discount. 100 stamps free for 3c postage. Write Now. Wincholt Stamp Co., Woodbine, 26, Penna.

OUR Latest 20-page U. S. and Canadian price list free. Stanley Gibbons, Inc., 37 Ann St., New York City.

STAMPS—20 Varieties unused free. Postage 2c. P. M. Miami Stamp Co., Toledo, O.

FREE 40 Czechoslovakia Stamps to approval applicants. 2c Stamp. Lightbown's, Osborne Rd., Southsea, England.

AMAZING Offer! 34 Stamps in Wallet, including 7 German, prewar value Forty Million Dollars. Price 8c if you ask for my Famous 60% Approvals. Thousand Unpicked continental Mission stamps 27c. D. M. Ward, 605 Pierce St., Gary, Indiana.

DANZIG Stamps Free—Interesting packet from Danzig with big catalogues free for 2c. Midland Stamp Company, Toronto, Can.

DIME approvals. Modern assortments. Sets—Packets—Singles. Free Premiums. Marney's, 400 Broadway, East St. Louis, Ill.

BEAUTIFUL Picture Stamps Sent Free. Paul Cornish, Schenectady, N. Y.

50 **DIFFERENT** United States 10c. 60% approvals. Reference please. Seidenberg, Baroda, Mich.

200 **STAMPS**, Bargain List, Magazine 15c. Harvey Teeple, Decatur, Ind.

16 **VARIETIES** Armenia 5c, Approval Applicants. Vincent Lorimer, Monmouth, Ill.

34 **VARIETIES** Cuban stamps, 10 cents. List of 6,000 low-priced stamps free. Address Chambers Stamp Co., 111P, Nassau St., New York City, N. Y.

COVERT Packet, 250 varieties unused and used stamps 15 cents. Covert Stamp, 89 State, Rochester, N. Y.

STAMPS, 100 all different. Postage 2c. Lists free. P. M. Quaker Stamp Co., Toledo, Ohio.

FREE! Loose Leaf Postage Stamp Album at rate of 8 pages each month given with subscription to monthly Journal. Send 2c stamp for prospectus. United Stamp Co., Marquette Bldg., Chicago, Ill.

RARE COINS

SPECIAL Bargains in United States commemorative half dollars in uncirculated condition. Lincoln, \$1.33; Maine, \$1.33; Pilgrim, \$1.29; Monroe, \$1.29; Lexington, \$1.27; Oregon Trail, \$1.29; Bennington, \$1.29; Norse American, \$1.45. 2c bronze and bargain price list 10c. Arcy, Box 483, Muskogee, Okla.

GET Profit and Pleasure in collecting Old Coins. Send 10c for Large Illustrated Coin Catalogue. You'll be delighted with it. Send for it right now. B. Max Mehl, Numismatist, Mehl Bldg., Dept. P, Fort Worth, Texas. Largest Rare Coin Firm in the U. S.

UNITED STATES, Large Cent, two-cent bronze, three-cent nickel and Bargain List, 25c. Fifteen dates large cents, \$1.00. George Coffin, Greenwood Mountain, Me.

UNITED STATES and Foreign Money; Military Decorations Catalogue and Greek coin 10c. Alexis Mengelle, Colorado Springs, Colo.

RARE Coin Book 50c; Illustrates all the coins of the United States, Mexico, Central and South America; also the prices we pay for rare U. S. coins. There is no other publication, at even twice the price, that can compare with this book which is entitled "Coins of the Americas." Old Coins Bought and Sold—We have the largest and most representative stock of coins in the United States. Send 2c stamp for Selling Price List. Compare our book and Prices. Guttag Bros., 16 Exchange Place, New York City.

\$2 TO \$500 Each Paid for hundreds of old and odd coins. Keep all old money, it may be very valuable. Send 10 cents for illustrated coin value book, 4x6. Get posted. Guaranteed prices. We buy and sell. Clarke Coin Office, LeRoy, N. Y.

25 **DIFFERENT** Coins 50c. Oddehon, Box 681, Kansas City, Mo.

CONFEDERATE Note, White Metal Coin 10c. 2 coins, 3 notes, 10c; Russian Note, German Bond and catalog, 15c. Geo. Best, Cedar Rapids, Iowa.

CENT over 100 years old 20c. Greenclay, 1626 Washington, Denver, Colo.

OLD Money Wanted. Do you know that Coin Collectors pay up to \$100.00 for certain U. S. Cents? And high premiums for all rare coins? We buy all kinds. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. H, Ft. Worth, Tex.

OLD Coins, Large Spring Selling catalogue of coins for sale free. Catalogue quoting prices paid for coins, ten cents. William Hesslein, 101A Tremont Street, Boston, Mass.

CALIFORNIA Gold—Quarter Size, 27c; 1/2 size, 53c; 3c Piece and Catalogue, 10c Norman Shultz, Box 746, Salt Lake, Utah.

FOR BOYS

EXPERIMENTERS: Small, powerful electric motors run by ordinary auto battery, only \$5. Order quick. Supply limited. Motor Service, Aberdeen, S. Dak.

BOYS—Machined parts for electric motor fuse. Write for particulars. Hudson Valley Specialty Co., Box 642, Poughkeepsie, N. Y.

COMPLETE Book on Magic. 563 pages, 318 illustrations. Hundreds of tricks. The standard book for years. Make money giving magic entertainments. Send no money. Just ask for Prof. Huffman's "Modern Magic." Pay postman postal charges and \$2.00. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

ELECTRIC Toys—Train outfits, motors, electric steam engines. Illustrated catalog 10c. Manhattan Co., 333a W. Manhattan Blvd., Toledo, Ohio.

SHALL I Become an Engineer? You can decide this all-important question better by reading a book called "Engineering as a Career," written by a group of eminent engineers. It costs only \$1.00. You will find the advice of these successful men to be of the greatest value. Pay postman price and postage when he hands you the package. Address Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

FILMS for Toy Machines, 200 feet \$1.50 Postpaid. Dixie Film Co., Box 2042, Memphis, Tenn.

FUN Making Things. Four large profusely illustrated books telling how to make almost everything from a sail boat to a toy automobile propelled by a motorcycle engine. Now \$2 per book or \$7 for the four if ordered at once. Send no money. Just write a postal saying, "Send the Boy Mechanic Library." Pay postman \$7 and postage. For single books, specify either Book 1, Book 2, Book 3, or Book 4. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

CAMERAS AND PHOTO SUPPLIES

PHOTOGRAPHIC equipment and accessories of every description are listed and illustrated in our 228-page catalog. It will pay you to secure a copy which is issued free, as our prices are low. We also deal in used goods which are sold under the same guarantee as new goods. Ask for our Bargain Book. Central Camera Co., Dept. E117, 112 S. Wabash Ave., Chicago, Ill.

GLOSSY Enlargement and twenty 1-A Prints, \$1.00. Essick, Ankeny, Iowa.

MAKE money in Photography. Learn quickly at home. Spare or full time. New plan. Nothing like it. Experience unnecessary. American School of Photography, Dept. 3432, 3601 Michigan Ave., Chicago.

KODAK Film—Special Trial Offer—Your next roll developed 5c, prints 3c each. Beautiful 6x10 mounted Enlargement 40c. Same-day Service. Fleet Photo Service, 825 G St., N. W., Washington, D. C.

HAVE You a Camera? Write for Free sample of our big magazine, showing how to make better pictures and earn money. American Photography, 116 Camera House, Boston, 17, Mass.

BIG Money Saved on Photographic Lenses and Apparatus—goods exchanged; repairing done. Ralph J. Goisen, 1128 Argyle St., Chicago, Dept. P.

FILMS Developed. Special Trial Offer. Any Size Kodak film developed 5c, prints 3c each. Trial 6x10 Enlargement in handsome folder 40c. Overnight Service. Roanoke Photo Finishing Co., 209 Bell Ave., Roanoke, Va.

GERMAN Cameras. Lenses. Bargains. Bartro, 6436 Hotel St., Los Angeles, Calif.

BEST Developing, printing, enlarging, hand work. Kodaks and Brownies at low prices. Ask information. Miles P. Greenwood, 84 Cottage St., Melrose, Mass.

MOTION PICTURES

FILMS: \$3.00 per reel up. Comedy, Western, Cartoon, Drama, Serial, Educational, Special Features. Best Movie Stars. Free List. Toy Film 200 Feet Postpaid \$1.50. Dixie Film Co., Box 2042, Memphis, Tenn.

NEW and Rebuilt Projectors for Theaters, Schools, Churches, Traveling Shows. Supplies and Complete Theater Equipments. Bargain Prices. Free Catalog. Monarch Theatre Supply Co., Memphis, Tenn.

\$\$\$ FOR Ideas. Photoplay Plots revised, criticized, copyrighted, marketed. Send for free booklet. Universal Scenario Company, 244 Security Bldg., Santa Monica and Western Ave., Hollywood, Calif.

SEND \$2.00 for startling new Cinemeter. Gives exact exposure for all Movie Cameras or lenses. Fits pocket. Free Bargain List of Motion Cameras. Bass Camera Company, 109 North Dearborn Street, Chicago, Ill.

LOOK, Boys! Genuine movie machines, low as \$5.00 postpaid. Free catalog. D. F. Elder, Dept. C, Chelsea, Mass.

NEW 100-foot spring motor camera, \$100; 16 1/2-foot spring motor camera, \$37.50. Eastman negative film 3 cents foot. Motor drivers suitcase. Projector \$50. Movie printer, \$25. 50-foot developing outfit, \$200. Films, \$2 reel. 5 Madza lamps, 25 volts, 3 amperes, \$5.00. Ray, 296, 5th Ave., New York.

BARGAINS! Machines, films, stereopticons, supplies. National Equipment Co., Duluth, Minn.

WESTERNS, features, \$2.00-\$3.00 per reel. Stewart Marshall, Rome, Ga.

FILMS 1/2 c. foot. Searles, 130 Fisk St., Providence, R. I.

FILMS and Machines, dirt cheap. Stamp for lists. Box No. 5836, Westport Station, Kansas City, Mo.

1000 **FEET** of Comedy, \$2.00. No lists. Sunset Film Exchange, 298 Turk St., San Francisco, Calif.

MACHINE, Films, rewriter, rheostat, curtain; all complete, \$65.00 C. O. D. Craig Brothers, Montgomery Center, Vt.

SERIAL Stunts. Film hundred feet, \$1. Film Classic, Fredonia, N. Y.

SCENERY TO RENT

WORLD'S Most Beautiful Settings for operas, plays, minstrels. Amelia Grain, Philadelphia.

EDUCATIONAL AND INSTRUCTION

YOU can have a business profession of your own and earn big income in service fees. A new system of foot correction; readily learned by anyone at home in a few weeks. Easy terms for training; openings everywhere with all the trade you can attend to. No capital required or goods to buy, no agency or soliciting. Address Stephenson Laboratory, 1 Back Bay, Boston, Mass.

STORY Ideas Wanted for photoplays and magazines. Big demand. Accepted in any form for revision, development and submission to markets. Send manuscript for free criticism. Booklet mailed on request. Universal Scenario Company, 403 Security Bldg., Santa Monica Blvd. and Western Ave., Hollywood, Calif.

FIREMEN, Brakemen, Baggage men (white or colored), sleeping car, train porters (colored), \$150-\$250 monthly. Experience unnecessary. 810 Railway Bureau, East St. Louis, Ill.

BE a Laboratory Expert. Earn from \$300 to \$500 Monthly. Study Microbiology Sanitation. Day, Evening classes, Diplomas, Degrees Granted. 71-piece outfit Free to students. Write for our Free Prospectus To-Day. International College of Microbiology, 2517 N. 76th Ave., Chicago, Ill.

FAMOUS Bailey Handbook—The book that prepares you to pass the examination for any grade of license for stationery, marine and Diesel engineers, firemen and boiler inspector in any state of the union or any province of Canada. Flexible cover. Handy pocket size. Pay postman \$2.00 plus the postage when he hands you the package. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

CARTOONING and Commercial Art. 25 lessons, 300 illustrations, 2 clothbound volumes and drawing outfit \$5 postpaid. Catalog Free. Nu-Way Art School, 220-B Graham Ave., Brooklyn, N. Y.

EDUCATIONAL books; all kinds; new and used. List free. Lyle's, Pisgah, Ala.

SHORTCUTS in Figures. The quickest ways of working all problems. Instructions for drilling yourself to become rapid with figures. Complete, yet simplicity itself. Send no money. Just write a postal for "Shortcuts in Figures." Pay postman \$1.25 and postage. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

EXPERT Methods, bookkeeping and shorthand course by correspondence. Good opportunity to increase your income. Phillips Instruction Service, Box 192 Highland Station, Springfield, Mass.

SWIFTHAND, the new writing system, revolutionizes handwriting, combining shorthand speed with the accuracy and legibility of print. New principle eliminates guesswork, despite speed. No abbreviations need be memorized. Scientifically based on the alphabet, but even easier to learn. Uses only longhand strokes. Particulars free. A. M. Woodstock, Dept. Z, 202 W. 49th St., New York.

DIESEL Engines—Marine, locomotive, stationary. Growing importance of the Diesel engine cannot be overestimated. This new book should be in the hands of every student of mechanical engineering. 500 pages, 280 illus. Pay postman \$5 and postage when he delivers book. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago.

EARN \$25 weekly, spare time, writing for newspapers, magazines. Experience unnecessary. Details Free. Press Syndicate, 981, St. Louis, Mo.

DOUBLE Entry Bookkeeping mastered in 60 hours with 8 keys; guaranteed; diplomas. International Bookkeeping Institute, Dept. 8, Springfield, Mo.

USED educational matter. Lowest prices; terms. Catalog free. Mention Subject. Fred Goetz, 440-A Sansome, San Francisco.

USED educational matter sold on repurchase basis. Also rented and exchanged. Money-back guarantee. Catalog free. (Books, etc. bought.) Lee Mountain, Pisgah, Ala.

HOW to detect artificial gold and diamonds in jewelry. Simple, sure tests that any one can make. 25c. Stone, Box 576, Bakersfield, Calif.

YOU Need a better grip on mathematics? Tell us to send you a copy of "Mathematics for the Practical Man," only \$1.50. By common sense methods it removes the mystery and difficulties so algebra and calculus are made simple. Assuming your knowledge is limited to arithmetic you quickly and easily gain a working knowledge of algebra, geometry, trigonometry and calculus. Simply pay postman when he hands you the package. Address Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

INSTRUCTION books, all kinds. Catalog free. Wincholt Book Co., Woodbine, 4, Penna.

CARTOONING and Commercial Art Work easily learned with new book. Complete art course beginning with simplest drawings and leading through higher branches of illustration. Profusely illustrated. Send no money. Just write a postal for "Commercial Art and Cartooning." Pay postman postal charges and \$1.25. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

RADIO OUTFITS AND SUPPLIES

TRADE Radio receiving parts (must be new condition, latest models), you cannot use for new parts you can use. Parts only, no sets. Catalog and over two pounds circuits, etc., prepaid. 25c. Radio Exchange, Kent, Ohio. (Established 1921).

RADIO Receiver; All stations—American and overseas; all wave lengths—200 to 4,000 meters. This 6 tube Gnome Polyphase, the latest development in modern radio. Agents wanted. 100% profit—\$100—per week easy. Radio Exchange, 925 Broadway, New York.

30 HENRY eliminator chokes, \$2.50. Transformers, \$3.75. Write for material list. Radio Parts Sales Co., Box 24, Orange, N. J.

20% DISCOUNT on latest Balkite chargers and eliminators, and Utah speakers. Booklets free. Simon, 6265 Cates, St. Louis, Mo.

GRATEST Radio value—\$18.45 for 5 tube 1927 model to introduce. Dealers and agents wanted. A. J. Musselman 236 Machinery Hall, Chicago.

WANTED: Men who have built two or more successful receivers. Can earn \$7 to \$10 spare time evenings. No selling scheme. Co-Operative Radio Doctors, Dept. H, 131 Essex St., Salem, Mass.

300-MILE "Pocket" Radio, \$2.00. No Tubes nor Batteries required. Useful and practical, loudspeaker volume. Order direct today. Spencer Laboratories, 116 Atlas, Akron, Ohio.

RADIO—Supplies—Parts: Lowest prices. Send stamp for list. Atwater Radio Shop, 118 Lexington Ave., New York City.

RADIO Up-to-the-Minute. Telegraphy, radio reception, vacuum tubes, telephony, how to build receivers, broadcasting, all treated in new book. Send no money. Pay postman \$1.25 and postage. Just write postal for "Radio Up-to-the-Minute." Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

TRADE AND TECHNICAL SCHOOLS

LEARN Bricklaying and earn \$1 to \$1.75 an hour. Wm. M. Woods, who has trained 500 men will teach you bricklaying in our school run by 800 builders interested in giving jobs to Mr. Woods' students. Tuition \$60.00 per month. Time required 3 to 6 months. Board and room \$8.00 to \$10.00. Work is actual bricklaying; you become master in the craft, in line for highest wages and promotion. Ample space and material. Catalog free. Associated Building Employers, M-400, A. B. E. Bldg., Grand Rapids, Mich.

GET a Foreman's job in any trade. You will earn more money. Become an expert Blue Print Reader. You can do it in spare time. My training will advance you quickly. Write now—tell me what trade you want—I will send my plan at once. Carroll Rumsey, 265 Drexel Building, Philadelphia, Penna.

BIG Pay Jobs. Learn Sign Painting, Decorating, Paperhanging, Show Card Writing, Graining and Marbling by practical training in a few weeks. Chicago Painting School, 148 West Austin Ave., Chicago.

TELEGRAPHY—Both Morse and Wireless—taught thoroughly and quickly. Tremendous demand. Big salaries. Wonderful opportunities. Expenses low; chance to earn part. School established fifty years. Catalog free. Dodge's Institute, Fern St., Valparaiso, Ind.

SHOW-CARD Writing and Sign Painting is a big-money business. Demand for expert work enormous. Learn from us quickly and easily. Free particulars by return mail. Detroit School of Lettering, 175 Stinson Ave., Detroit, Mich.

TRAIN for big pay electrical jobs on half million dollar equipment. Earn while you learn. Learn right. Low rates. Write for free book. National Electrical School, 4006 Dept. 40 Figueroa, Los Angeles.

AUTO Industry wants national-trained men. Salaries \$50 to \$200 weekly. National has helped 16,000 inexperienced men to big pay. Earn while you learn in Los Angeles. Million dollar shops. Write for free book. National Automotive School, 4006 Dept. 30 Figueroa, Los Angeles.

BUSINESS OPPORTUNITIES

ANYONE handy with paint brush can earn five thousand dollars or more yearly installing Walex—a beautiful plastic paint of many shades and textures. Walex is installed in homes or buildings where beautiful appearances are desirable. Sells on sight. Get full particulars Everlastone Products Corp., Everlastone Square, Baltimore, Md.

NOTHING on earth offers bigger opportunity for building wonderful business this summer than manufacturing these popular profitable, big-selling specialties. Start small—watch business grow. Write today for valuable formula literature relative to making: Sealite, guaranteed puncture proof liquid; Ducopol, automobile polish; Cellulac, Duco finishes in color, quick drying; Solvit; powdered hand cleaner; Miracle, non-thermic ice cloths, mendit, fabric patching liquid; Liqui-Seal, radiator cement; Vanil-Ozone, "million-dollar" vanilla flavor; Fruittina; concentrated summer drinks; and a hundred other real honest-to-goodness, money-making propositions. 30 years headquarters for best formula service. Miller, Chemist, 1706-B Jetton, Tampa, Fla.

PAINTERS and decorators know that 90% of the houses are painted each year because they are dirty and not because they need paint. Anyone can wash houses at a third of the usual cost with the Nielsen Lightning Washer and make more money than on a paint job. This machine attaches to electric socket and water faucet. Go into a profitable business for yourself. Exclusive territory to men with business ability. Write or wire for your territory, photos, and proposition. Nielsen Industries, Inc., 5411 Cicotte Ave., Detroit, Mich.

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence O. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

LARGEST Corporation in the field manufacturing a complete line of oil burners sold direct and through dealers and salesmen, requires branch manager for this territory. We handle installment paper, help organize territory and furnish advertising matter. \$1000 required, returnable if for any reason either party is not satisfied. Should net \$7500 to \$10,000 per annum. We pay expenses to Chicago for qualifying applicant. Sales Manager, 114 No. May St., Chicago, Ill.

READ The Mail Order News—America's Pioneer Mail Trade Journal. Quarter Century Old. Approximately 600 pages yearly of valuable information for beginners an established mail-order houses. Analyzes mail-order business, its opportunities. Practicable mail-order ideas, legitimate money-making schemes, instructive articles. Tells how to start, what to sell. Published monthly. Subscription \$3.00 yearly. Send 25c for sample copy. None free. Mail Order News, 360 Bristol Bldg., New York.

ARTIFICIAL marble sanitary flooring instructions, covering wood or cement flooring 1/4 inch thick, fireproof, waterproof, all colors, low cost. Ornamental casting, concrete, plaster, papier-mache decorations, garden furniture, statuary, flexible molds. 17 years instructing the public; particulars and illustrations free. Chris. Mahler, Huntington, N. Y.

ENTER a new business. Earn \$3,000 to \$6,000 yearly in professional fees making and fitting a foot specialty, openings everywhere with all the trade you can attend to; easily learned by anyone at home in a few weeks, at small expense; no further capital required, no goods to buy, job hunting, soliciting or agency. Address Stephenson Laboratories, (1) Back Bay, Boston, Mass.

GOLD, Silver and colored sign letters for windows, sign boards, trucks, automobiles. Make them yourself with our instructions and letter patterns. Fast sellers, big profits all or part time. No experience required. Field unlimited. Collect two profits, making and selling. Stamp brings actual sample and complete description. Enterprise Systems, 616 North Michigan, Chicago.

LEARN to Manufacture—It pays big profits. We teach you how. Start spare time. Few dollars. At home. We show you how to sell. Write for free circular. Heartinger System, 2202 Wyoming, St. Louis, Mo.

BIG Profit Refiltering Crankcase oil, small capital. Pan-Cam Filter Co., Escondido, Calif.

95c PROFIT on \$1 steady repeat orders. Others high as \$432. Sold by mail, direct or both. Exclusive territory, real living and you own our long established business, name, registered trademark, formulas, everything Proco, 728 Filbert St., Pittsburgh, Pa.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

CANDIES Home Made—Cost 14c, sell for 60c. Almost no cash capital needed. We teach you by mail making and selling. All ages, ladies or men. Start in home. Sell to stores. We furnish tools free. Free booklet. Capital Candy School, Dept. 33-FF, Washington, D. C.

MIRRORS Resilvered at home. Costs less than 5 cents per square foot; you charge 75 cents. Immense profits, plating like new; brassy worn-out autographs, reflectors, tableware, stoves, etc. Outfits furnished. Details Free. Sprinkle, Plater, 127, Marion, Ind.

MAIL Order offers unlimited opportunities. Get free offer today. Messenger, Dept. 62, Stillwater, N. Y.

PLANS for Legitimate Furniture Polishing Business, \$2.00. Guaranteed. Zaffer, 138 Wolcott, Astoria, N. Y.

150 MONEY-MAKING Plans. Proved and tested. Explained in "Opportunity Monthly." Send only 10c for 20c copy. Taylor Co., Publisher, 1874 East 27th, Brooklyn, N. Y. Suite 62.

TASTE flavor of real money selling Annie Blain Flavors, wholesale, retail; new system, samples; other unique methods. Geo. S. Parker, New Brunswick, N. J.

MAKE Money in your spare time. Start small mail-order business at home. Easily and quickly learned. Operated anywhere. Write for free particulars. P. M. Hilco, 62 South Sharnan, Denver, Colo.

WE Start you in business without a dollar. Taylor made-to-measure caps and eight other big profit-makers will make you \$60 to \$90 a week. Pay in advance. We deliver. Free outfit. Taylor Cap Manufacturers, Desk W-80, Cincinnati, Ohio.

THAXLY Formulas and processes produce perfect products. All kinds. All lines. Catalog, special circulars free. B. Thaxly Co., Washington, D. C.

SELL by Mail! Books, novelties, bargains! Large profits! Particulars Free! B-Elco, 525 South Dearborn, Chicago.

NEW Business. Virgin field. Your own boss; permanent; no traveling. 2c stamp. Hurry. Pacific, Princeton, Ore.

500,000 DIFFERENT articles can be sold by mail. Our new complete course gives proved successful systems in detail. Covers entire business. Also 100 guaranteed workable plans. Northwestern Mail Order Service, Box 93, Omaha, Nebr.

FREE—5 formulas; big mail with year's subscription Porter's Magazine containing articles mail selling and buying 25c. Porter's Publications, 9416a 115th St., Richmond Hill, N. Y.

LEARN Real estate business. Make \$6,000 yearly. The Educator, new edition, book form, 208 pages. It's the key to success. Sells for \$2.00. Better than a \$30 correspondence course. Get facts. C. P. Winegar, West Port Ann, N. Y.

ATTENTION! Men with self-confidence! Establish new system real estate business, brokerage and insurance agency. Earn \$5,000 year. Stamp free booklet. Representatives wanted. Hayes Realty Association, Cincinnati, Ohio.

MAKE Money at home, spare time, evenings. I am, others are, you can. Circular free. B. M. Smith, Box 369, Morristown, New Jersey.

INCOME Increaser—Newly enlarged 36-page monthly magazine of best, latest ideas, plans, schemes, tips, pointers, starters. One year, \$1.00. Three months, 25c. Income Increaser, 63P Court, Boston, Mass.

START Your own business in basement; repair and renew tires. I did, on farm, now have big shop. Autos come to you, customers everywhere. Electric or steam machine does it, 30-75 pounds; any size tire. Instructions free with machine. Free particulars how to start, territory. Ortday Co., 379 S. Warren, Trenton, N. J.

MANUFACTURE new fast-selling novelties, toys, mail order and agent's specialties. Free list reliable, plans, patterns, processes, commercial information. Manufacturer's Bureau, R32, 1159 East 31st, Kansas City, Mo.

START Profitable mail order business New plan. Circulars. Everything 25c. The Wholesale Company, Akron, Ohio.

15c PUTS your name on mailing list year. Receive offers, magazines, Kentucky Agency, Covington, Ky.

LEARN to make molds for statuary, dolls, vases, ornaments and other easily sold specialties from marble, lead, rubber, wax and 35 other compositions. Commercial methods. Easily learned. Simple, practical, profitable. Free literature. Manufacturers, R5, 1129 East 31st, Kansas City, Mo.

MAKE Toys, novelties, furniture; complete outfit, \$1.00. William Bogren, 2264 Hermany Ave., New York.

MAKE Your own polishing cloths; complete instructions 25c (coin). Enormous profits. Markert, 400 N. C., Muskogee, Okla.

ARE You Old at Forty? See our advertisement on page 70 of this issue. The Electro Thermal Company, 2169 Main St., Steubenville, Ohio.

ALL-METAL Screen frames made without Tacks, Nails, or Screws. Hinged or Sliding. 4 corners 50c. Strips 10c foot. A Profitable business anywhere. Diamond Hdw. Mfg. Co., Fourth Ave., Pittsburgh, Pa.

FIRST call for Exclusive Distributors! Organize salesforce for new store necessity. Unusual profits. Davis Co., 173 Newbury, Boston.

WE Start You in Business, furnishing everything; men and women, \$30.00 to \$100.00 weekly operating our "New System Specialty Candy Factories" anywhere. Opportunity lifetime; booklet free. W. Hillyer Hagsdale, Drawer 4, East Orange, N. J.

I MADE \$30 a Week Home. French Breadmaking. 15 years' experience; Free Booklet tells. Ashbrook 67, Marengo, Ohio.

UNPATENTED Ideas Can Be Sold. I tell you how and help you make the sale. Free particulars (Copyrighted). Write W. T. Greene, 810 Jenifer Building, Washington, D. C.

MAKE toys and novelties at home. Big profits. Instructions and illustrations, 25c. Astrolite Company, Sharpsburg, Pa.

"SCHEMER," Alliance, Ohio, 36 p. monthly, prints Schemes, Tips, Formulas. Subscriber reports \$25,000 from three; another \$10,000 from one. Try it! Year, \$1.00; 3 months, 30c.

MAKE Money at Home—making animal toys. We show you how. Send \$1 for complete working drawings and instructions. DeKalb Designing Co., Decatur, Ga.

START Mail Order Business of your own at home. We supply catalogues with your address on. Wincholt Sales Co., Box 4, Woodbine, Penns.

CHARTERS: Delaware; best, cheapest; free forms. Colonial Charter Co., Wilmington, Del.

OPERATE money-making mail-order business in spare time. Write for free particulars. Triangle Mail Order Service, 600 Blue Island Ave., R31, Chicago.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, C3-805, Wheaton, Ill.

MAIL Order Information, where to buy goods. Specialties. Imprint circulars, everything for mail order business 25c. Harvey Teeple, Decatur, Ind.

FREE Mail Order Information. Write today enclosing stamp. Mason, 3900 Broadway, Room 5, Chicago.

RAISE Money for invention, any business proposition. Inexpensive, reliable method. Interstate Service, Elizabeth, N. J.

RESPONSIBLE manufacturer wants competent men to manage office and salesmen. \$300 to \$1,500 necessary; will allow expenses to Trenton if you qualify. Address Manager, 536 Forst Richey Bldg., Trenton, N. J.

PATENTS Procured; Trade Marks Registered—A Comprehensive, experienced, prompt service for the protection and development of your ideas. Preliminary advice gladly furnished without charge. Booklet of information and form for disclosing idea free on request. Richard B. Owen, 30-Owen Bldg., Washington, D. C., or 41-R Park Row, New York.

MECHANICS, painters, carpenters, start furniture refinishing, painting, handyman shop on nearly nothing; winning plan brings customers quickly. John Braceland, 1439 So. Ninth, Philadelphia, Pa.

\$750,000,000 MAIL order business in 1925. Many grow rich in this great trade. Sell merchandise, information, patented articles various preparations. Breniser's Famous Mail Order Handbooks tell how. Eleven brochures \$3. One book with complete catalog, 25c; none free. Breniser, (Established 1900), 1607 Sansom, Philadelphia.

DELAWARE Incorporator. Charters; Fees Small; forms. Chas. G. Guyer, 901 Orange St., Wilmington, Del.

CHEMICAL Expert will furnish Formulas and Trade Secrets. All lines. Lists Free. W. L. Cummings, Ph. D., 228 Gordon Ave., Syracuse, N. Y.

LEARN the collection business. Good income, quick results. Interesting booklet, "Skillful Collecting" free. National Collectors Assn., Long St., Newark, Ohio.

EARN \$10 daily silvering mirrors, plating and refinishing metalware, autos, chandeliers, bedsteads, headlights. Outfits furnished. E. Decie Laboratories, 1133 Broadway, New York.

DON'T gamble in mail order business. Be sure. Free circular puts you wise. MacRae, M40 Oregonian Building, Portland, Ore.

NOW That you have read all these offers, send 50c for detailed information. (None free). "How" and "What" to sell by mail; through agents; or direct. We want 200,000 representatives! Opportunity is knocking—Answer! Surety Service, Dept. 275, 25 Exchange St., Rochester, N. Y.

TELEGRAPHY

TELEGRAPHY—Both Morse and Wireless—taught thoroughly and quickly. Tremendous demand. Big salaries. Wonderful opportunities. Expenses low; chance to earn part. School established fifty years. Catalog free. Dodge's Institute, H St., Valparaiso, Ind.

CHEMISTRY

EXPERIMENTERS' laboratory apparatus. Chemicals. List 5c. Chemical Apparatus Co., 4402 West End, Chicago.

YOUR chemical problem solved and working formula or process furnished for \$5.00. Write me. W. Stedman Richard, Industrial Chemist, Box 2402, Boston, Mass.

FORMULAS AND TRADE SECRETS

JUST out, never before published. Book of formulas on fireworks, red, white, blue, green, yellow fires. Flashlight powders, one hundred thousand candle power white light. Colored smoke, bombs, explosives, liquid glues, waterproof cement, liquid shellacs, red, black, transparent, elastic drab and other trade secrets; these formulas disclosed for the first time by the originator retiring from the manufacturing business. Every formula guaranteed or money refunded. Price \$1.00. Frank Dutcher, Pyrotechnicist, Rogers, Ohio.

FORMULAS: Absolutely guaranteed. Best chemical science has devised. Don't risk your money till you've investigated these wonderful processes for all lines. Get my valuable "eye-opening" literature. Highest references. 30 years supplying the best. Miller, Chemist, 1706-P Jetton, Tampa, Fla.

AUTO Formulas. Resilient tire filler, punctureless, blowoutless, lasts double time, \$5. Battery recharger, \$2. Antipuncture compound, \$2. Radiator Neverleak, \$1. Other formulas, \$1. Analysis, \$3. Consultation. Associated Chemists, Indianapolis, Ind.

AUTO Polish. Formula and year's subscription to Worthwhile, 25c. Worthwhile, D23, 130 Cady, Rochester, N. Y.

20c—ANY Formula, 20c. "Hawkins," 215 Las Animas, Colorado Springs, Colo.

THAXLY Formulas and processes produce perfect products. All kinds. All lines. Catalog, special circulars free. B. Thaxly Co., Washington, D. C.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

TWENTY Money Making Methods. Write Bruce Hudson, Clarks Green, Pa.

15,000 FORMULAS in "Scientific American Encyclopedia of Formulas." Includes following and many others: Accidents and emergencies, agriculture, alloys and amalgams, artist's materials, beverages, cements, glues, pastes, mullages, bleaching, renovating, coloring metals, dyeing, glass, heat treatment of metals, household formulas, ice cream, confectionery, chewing gum, lapidary work, exterminating vermin, lubricants, paints, varnishes, photography, condiments, canning formulas, rubber, soap, candles, soldering, toilet preparations, perfumes, waterproofing, fireproofing, writing materials. Send no money. Just write a postal. When postman hands you book pay \$5.50 and postal charges. Popular Mechanics Press, Room 905, 200 E. Ontario St., Chicago, Ill.

FURNITURE Polish formula. Make big money making and selling furniture polish. Cost you only seven cents a bottle—sell it 50 cents. Send 25 cents for formula. 219 West 9th, Waterloo, Iowa.

500 FORMULAS including Luminous Paint—Renewing Dry Batteries—Resilvering Mirrors—Gas Tonic, Puncture Plugger, 25c. Catalog Free. Ideal Book Shop, Park Ridge, Ill.

AGENTS WANTED

AGENTS—Students, clerks, or others having a few hours weekly spare time. New York corporation, established 15 years, requires men in each town and city. (1) To take orders for old established product from retail merchants, banks, etc. (2) From group 1 we will develop permanent local sales representatives. (3) From groups 1 and 2 we will develop agents to travel monthly or all year. Carfare and salary paid. Our men cover every town in U. S. A.—part of Canada. Previous experience in selling not necessary. No cash required. Our customers include many of the largest well known corporations, merchants, banks, etc., in the country. Write for full particulars, state age, references, etc. Rogers, P. O. Box 76, Madison Square Station, New York.

SOFT Drinks in Powder—Orange, cherry, strawberry, etc. Makes best drink you ever tasted. Just add cold water and sugar. Reliable people wanted to place our drink powders in stores and appoint agents. Big profits to stores—you make 80c to \$3.00 profit on each sale. Retail 10c package, makes 10 big glasses. Very attractive advertising matter—nearly everyone buys. Repeat sales sure. Also larger packages for those who sell by the glass. 85c clear profit on each dollar at 5c glass. Particulars free, or send 10c for 10 glass package; 50c for seven packages, all kinds (70 glasses), postpaid. Chas. E. Morrissey Company, 4417 Madison St., Chicago.

PRIVATE Brand toilet articles, household specialties, perfumes, soaps, extracts, etc. We pack these goods for you under your private label. With your name on the goods you get all the repeat business. Don't sell for others but build up a profitable business for yourself. Highest quality merchandise. Extremely low prices. Immediate shipments on both small and large orders. Write at once for low wholesale prices and complete information regarding our amazing offer. Address Supply Department, National Scientific Laboratories, 1904W Broad, Richmond, Va.

AGENTS—\$13.80 daily in advance, introducing new insured hosiery for men, women, children. Must wear or replaced free. 57 styles, 39 colors, including latest "Silk to the Top" ladies' hose. Nyland made \$395 in one month. Edwards, \$460.60, Mrs. Bone, \$425.45. Why not you? Even spare time should pay you \$3.00 an hour. No experience needed. We furnish samples. Silk hose for your own use Free. New plan. No matter what you are now doing, write quick. Macoshee Company, Road 2365, Cincinnati, Ohio.

KAJIYAMA, World-renowned Japanese mental wizard, famous on vaudeville stage, introduces his latest invention. Make big money selling this article, a blessing to all who walk. Sells by showing. Once tried always desired. Send size of shoe and 50c for sample and literature. Tee-Kay Manufacturing Company, 29 Quincy St., Chicago.

COLLAPSIBLE Hat and coat hanger is found on page 150, fast seller and big profits. Just ready for the market. 75 cents for sample.

HUNDREDS of manufacturers, formerly agents selling other goods now owe their success to Miller's Guaranteed Formulas for making biggest-selling, advertised specialties in all lines. Investment small. No machinery needed. Profits great. Make your own goods—get the profit you're entitled to. Write today for my "eye-opening" literature. It's free and tells all. Miller, Chemist, 1706-W Jetton, Tampa, Fla.

72 SALES in four hours. Profit \$64.80 (sworn proof). That's the record of "Doc" Barber. Every woman buys on 10 second demonstration. Profit up to 150%. We want 500 ambitious men and women. Exclusive protected territory. New self-wringing mop that really wrings dry without wetting hands. No gears, bolts or screws. Weighs only 2 pounds. Simple, practical, perfect. Lasts a lifetime. Territory going fast! Write quick! Delphos Mop Co., 1015 Tenth St., Delphos, Ohio.

AGENTS, Salesmen, Crewmen—You'll have the Devil's own time finding a better seller than "Zippo." Splendid profit on snappy 50c "Go-Getter" repeat article that sells on a ten second demonstration. Works while you watch it! Demonstrates value while others waste time making claims. New development! Greatest scientific triumph of the age! It's the berries! Write immediately for complete proposition. Karam-Smith Company, 605 Bozart St., Fort Wayne, Ind.

AGENTS—To Sell the New Featherweight All Purpose Waterproof Coat. Weight only 26 ounces, latest styles and colors. Men's \$1.98, Women's \$3.98. Liberal commissions. Write today for sales plan. Featherweight Coat Company, 5719 Euclid Ave., Cleveland, Ohio.

WANT \$500 Soon? Sell beautiful Dresses, Coats, Scarfs, Sweaters. Amazing low prices. We deliver. No experience necessary. Get complete outfit free! Write Hirshey Knitting Mills, 1962 South California Ave., Chicago.

\$100 WEEKLY representing large Direct to Wearer Company. Complete shirt, necktie and work clothes line. Unbeatable combination means selling everyone. Advanced commission and bonus. Sales Compelling Outfit Free. Howard Shirts, 1213 VanBuren, Dept. M26, Chicago.

\$50,000. PICTURE Man Friedman made canvassing. Beginners can make \$100.00 weekly with my sales talk. Experienced men make more. Free book. "Profits in Portraits" explains. Samples Free. Picture Man Friedman, Dept. 8-G, 541 W. Lake, Chicago.

AGENTS—Make a dollar an hour. Sell new kind of sharpeners. Sharpens all knives and tools quickly. Demonstrating sample free. Premier Mfg. Company, Dept. 67, Detroit, Mich.

AGENTS, portraits, photo-pillow tops, frames, sheet pictures, medallions, photo-jewelry, guaranteed hose, laundry tablets, food products, toilet requisites, luminous crucifixes. Catalog 50 specialties free. 30 days' credit. Jas. C. Bailey, Dept. C-5, Chicago.

JUST Out—Patented Apron. No strings or straps; on or off instantly; \$20 a day easy; every demonstration a sale; over 100% profit; commissions daily; write today for free offer. Staput Co., Dept. 205, St. Louis, Mo.

AGENTS—Radio product; unlimited possibilities! Write. Kintley Electric Co., 2663 Main St., Buffalo, N. Y.

BIG Pay to agents selling Mother Hubbard food and household specialties and toilet preparations. New selling plan. Mother Hubbard Co., 558 Congress, Chicago.

100% PROFIT selling mothproof garment bags. Free sample offer. Catalog of other specialties. National Fibre Broom Co., St. Louis.

\$25 DAILY taking orders high grade low priced knitted sport sweaters. Finest merchandise in America. Outfit free. Crawford-Mills, 103-05-B, East 16th St., Chicago.

\$25 DAILY demonstrating low priced guaranteed bed spreads. Easy sales; outfit free. Household Supply, 1603 A, Michigan, Chicago.

GOLD Leaf window letters and script signs. No experience; 500% profit. Samples free. Consolidated, 69-U West VanBuren, Chicago.

HOSIERY Free and \$12 daily. Sell nationally known pure silk hosiery. Amazing values. Experience unnecessary. Free sample outfit mailed immediately. Pure Silk Hosiery Co., 208 W. Monroe, Dept. P-38, Chicago.

AGENTS—\$240 month. Startling new invention. Self-wringing mop. Simply push button and it's wrung. Hands never touch water. New quick selling plan. \$2.00 hour part time. Sample furnished. National Products Company, Plan 631, Dayton, Ohio.

SELL Corn remover display easels to stores. Big profits. Tyrrell Products, Martins Ferry, Ohio.

AGENTS: \$15.00 daily easy with amazing fluid. Mends hosiery, dresses and 1000 other articles in a few seconds. 50% to 200% profit. Free outfit. New Way Laboratories, Desk K7, Mt. Healthy, Ohio.

JUST Out—Amazing new Air-Burning Self-Heating Flat Iron. Housewives wild about it. Cuts ironing time in half, saves 779 steps per average ironing. No tubes, No wires. Sells fast. \$90 a week is easy. No capital needed. No delivering. New plan. Write quick for territory and free outfit offer. Akron Lamp Co., 1020 Iron St., Akron, Ohio.

JUST out—Amazing invention. One de- vice makes window washing 75% easier. Washes, dries, polishes windows in a jiffy. Every housewife wants it. No more ladders to climb, no mussy rags to wring. Hands never touch water. Sells fast. 100% profit. \$90.00 a week is easy. Send for catalog of this and 47 other Quality Rubber Products Direct from Akron, the Rubber City. Free outfit to hustlers. Write quick. Kristee Mfg. Co., 76 Bar St., Akron, Ohio.

AGENTS make \$40 to \$80 weekly selling typewriters re-manufactured like new by the "Young Process." Lowest prices and easiest terms ever offered. Big commission—no investment—real opportunity to start in business for yourself. Write today. Young Typewriter Co., Dept. 7105, 654 W. Randolph St., Chicago, Ill.

\$5 SAMPLE for \$1! Amazing 30-day offer to interest new salesmen in quickest selling spare-time, side-line article known! Mexican Blu-Flash Gem positively matches finest genuine Diamond side-by-side; defies experts; sells on sight! Guaranteed 20 years; sensational profits! \$5 dazzling, brilliant blue-white, sample Gem and free Sample Case proposition mailed you C. O. D. \$1.00 on request. Write quick! Mexican Gem Company, Box P8C, Monterey, Calif.

AGENTS: Salesmen—Sell New Thermo- static Automatic Carburetor Control Attachment for Fords. Big profit, full or part time. Increases mileage 50-100%. Attached in two minutes. No drilling. Cadillac now using Thermostatic Carburetor Control under Blanche license. Sales guaranteed. \$15.00 a day Guaranteed to Distributors. Write today. Blanche Auto Device Co., Dept. 805-G-X, 157 E. Erie St., Chicago.

EXPERIENCE Unnecessary, remarkable discovery removes drudgery from polishing table silver, auto trimmings, all metalware, furniture. Abolishes sticky pastes, messy liquids and powders. Startling demonstrations make sales self-closing. Low price; quick cash gain. Up to 233% profit. Test samples free. E. A. Lightning Corporation, 1773 Greenleaf Ave., Chicago, Ill.

MAKE Steady money giving housewives free premiums. Representatives with us over 25 years. New plan with 400 grocery products. Landermilk made \$25 one order. Strong \$32 in day. Richardson \$75 week. Write Great Eastern Coffee & Tea Co., Dept. E-1040, St. Louis, Mo.

\$75-\$125 WEEKLY taking orders colored slickers. \$10.00 value \$2.95. Commissions advanced. Full or spare time. Samples free. King Outfitters, C-1809 S. State, Chicago.

NEWEST Invention: Abolishes kinks, snarls, and automatically coils telephone, electric iron and lamp cords. Housewives, companies actually buying 5 to 50. Tremendous profits. Samples worth \$3.40 free. Neverknot, Dept. A-5 4503 Ravenswood, Chicago.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

"MAKE And Sell Your Own Goods"— Tremendous Profits; No machinery; No experience; We show you how; Write quick for Free Book. Clover Laboratories, (P) Parkridge, Ill.

\$16 A DAY Easy—I start you in auto accessory business; no investment; no experience necessary. Landin, 3433 Montrose Ave., Chicago.

GENUINE Gold Leaf Letters anyone can put on Store windows. Guaranteed to never tarnish. Large Profits. Enormous Demand. Free Samples. Write today. Metallic Letter Co., 438-D North Clark, Chicago.

MEN Wanted—Make name and number plates; also teach the work to others. Outfits furnished. Illustrated book free. Big Four Co., 409, Ashland, Ohio.

\$18 TO \$25 daily. Biggest selling line of 2-piece suits, \$9.95 and \$12.50; 3-piece wool suit, \$17.95 (regular \$28.00 value). All-wool overcoat, \$18.50. Splendid raincoats, slickers and boys' suits. Biggest commissions. Free outfit. "Jim" Foster, Inc., Dept. 17, 2250 S. Spaulding Ave., Chicago, Ill.

CHIPPED Glass Name Plates. In three colors. Very attractive. Agents wanted, sample 50c. Harvey Richard, 337 Hamilton St., Southbridge, Mass.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, C5-805, Wheaton, Ill.

\$75 WEEKLY. Man or Woman Wanted with ambition and industry to distribute Rawleigh's Household Products to steady users. Fine openings near you. We train and help you so you can make up to \$100 a week or more. No experience necessary. Pleasant, profitable, dignified work. Write today. W. T. Rawleigh Co., Dept. IL8253, Freeport, Ill.

1927 PRUITT-SHERIDAN Trade Directory. Tells where to buy half million articles at wholesale, \$1.00 postpaid. H. J. Smith, 41 Hill St., Newark, N. J.

AGENTS: Steady income \$240 month. A business of your own. Over 200 fast sellers. We furnish selling outfit. Write quick. Stuart & Co., Dept. 631, Newark, N. Y.

THANCO Vanilla—Bottle yourself! Concentrated; add water. Free labels. Whirlwind seller. 500% profit! Crushes competition! Other profitable products. Write Thomas Manufacturing Company, Indianapolis, Ind.

AGENTS \$72 Week. Brand new tool chest, 8 tools in one. Fine leather case. Fits hip pocket. Demand enormous. Write quick. Novelty Cutlery Co., Chest 831, Canton, Ohio.

AGENTS \$60 a Week. Dri-Klean-It makes any car look like new. Removes mud, grease, tar, all in one operation. No soap or water used. Write for samples. American Accessories Co., Desk 1231, Cincinnati, Ohio.

TIRED of working for other people? Without experience, training or capital I'll show you how you can become financially independent. Easy, pleasant work. \$100 profit every week. Free automobile. Write today for particulars. Albert Mills, Mgr., 9208 Monmouth, Cincinnati, Ohio.

AGENTS: \$14.85 daily in advance. Bonus besides. Send for sworn proof. Introduce finest line guaranteed hosiery you ever saw. Beats store prices. 126 styles, colors. New selling plan. We deliver or you deliver, suit yourself. Auto furnished. No experience needed. Spare time satisfactory. Credit given. Samples furnished. Wilkint Hosiery Co., Dept. 2231, Greenfield, Ohio.

I'LL pay you \$160 month taking orders for Jennings Guaranteed Hosiery. New plan puts you above competition. Write quick for amazing offer. Jennings Co., Dept. 2831, Dayton, Ohio.

GREAT Phonograph Bunk exposed! Cheap invention makes old phonograph play like expensive orthophonic style reproducers. 14,000,000 phonographs, instant sales. Tremendous profits. Everplay, Desk A-5, 4503 Ravenswood, Chicago.

300% PROFIT: Whirlwind selling household, store, office necessity. Fast repeater. Free sample. Magic Products, Room 200, 332 East 31st, Kansas City, Mo.

\$25 DAILY taking orders big line colored raincoats and Rayon bedspreads. Free samples. Pay daily. Northern Fabric Co., Dept. N, 186 No. LaSalle, Chicago.

100 MORE active men to introduce Chieftain Guaranteed Tailored Shirts, 3 for \$4.95. Latest novelties, colors. Dickman, Illinois, in 3 weeks made \$589; Sinton, Texas, in 12 days, \$219.60; Bend, Iowa, in 16 days, \$334.80. Why not you? No experience or capital needed. We deliver and collect. Full working outfit free. Cincinnati Shirt Company, Lane 1585, Cincinnati, Ohio.

AGENTS if you want to give your customers the best house dress values in the country and make real money, write B & G Mfg. Co., Dept. 179, Pittsburgh, Pa.

PARTNER Wanted to introduce beautiful fit-to-measure style-arch shoes for women. No capital required. We furnish everything, including actual sample shoes. Amazing values at \$3.95 and \$4.95. Can make \$60 to \$135 in cash, plus semi-yearly share of company's profits. Write at once for full details. No experience necessary. Style-Arch Shoe Co., Desk R-141, Cincinnati, Ohio.

I'LL Buy your time, as much of it as you want to sell—an hour a day or eight hours—and I'll pay you the highest rates, provided you're a worker and a square shooter. If you are, address Salesmanager, 844 West Adams St., Dept. 909, Chicago.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

\$10.00 SLICKERS only \$2.98. Biggest commissions. Represent manufacturer. 10 colors. Free outfit. Roselle Manufacturers, 713 Roosevelt Road, Dept. H-2, Chicago.

SELL Tailor-Made Shoes. Sensational new fitting discovery eliminates foot troubles; makes walking a pleasure. 75 men's and women's styles. 60 leathers. Prices lower than stores. Big commissions. Free outfit. Free sample shoes. Tailor-Made Shoe System, 932 Wrightwood, Dept. OA5, Chicago.

NEW Wonderful Seller. \$1.40 profit on every \$1.50 sale. Monogramming autos. Free samples. Monogram Co., Desk 10, Worcester, Mass.

AGENTS: Greater profits, year round sales, complete guaranteed line dress and work shirts, overalls, coveralls, work pants, play suits. \$10-\$25 daily easy. We show you. Complete outfit free. Nimrod Shirt Co., Dept. 8, 4922-28 Lincoln Ave., Chicago.

THANCO Vanilla—Bottle yourself! Concentrated; add water! Free labels. Whirlwind seller! 500% profit. Crushes competition. Other money-makers. Write Thomas Manufacturing Company, Indianapolis, Ind.

AGENTS: \$15.00 daily easy with amazing fluid. Mends hosiery, dresses and 1000 other articles in a few seconds. 100% to 200% profit. Free outfit. New Way Laboratories, Desk K-15, Mt. Healthy, Ohio.

BIG Profits with exclusive territory; household necessity. Real money maker. Write today for free particulars. Roberts Metallic Bathing Co., 740 Meldrum Ave., Detroit, Mich.

WANT Distributing Agent for Handslick, powdered hand soap; removes anything from hands; everybody a customer; sample free. Solar Products Co., J-2142 S. Troy, Chicago.

AGENTS—Best seller: Jem Rubber Repair for tires and tubes; supercedes vulcanization at a saving of over 800%; put it on cold, it vulcanizes itself in two minutes, and is guaranteed to last the life of the tire or tube; sells to every auto owner and accessory dealer. For particulars how to make big money and free sample, address Amazon Rubber Co., Philadelphia, Pa., Dept. 505.

AGENTS: both sexes, we manufacture and control new household article. Fast seller. Big profits. Exclusive territory. Write now. Connolly, 123 Liberty St., New York.

\$25 DAILY showing \$2.98 slickers. \$1.25 gift to customer makes sales easy. Outfit free. American, 724P Roosevelt, Chicago.

AGENTS Can make \$250 weekly following our proven successful selling plan. An article you will never want to change from selling. Strictly first class every respect; just exactly right price to make big worthwhile money selling; over 75,000 sold in Philadelphia. Real \$250 weekly proposition appointing sub agents, agencies, individual sales. Faxley-Halpen, Desk 40, Philadelphia, Pa.

NEW Article sells 50c; give 25c article free; profit 35c. Write Superior Specialties Co., P. O. Box 583A, Springfield, Ill.

REPRESENTATIVES Wanted: Have a real income. District managers and agents wanted to sell line of guaranteed hosiery. Liberal commission. Mikado Hosiery Company, South Bend, Ind.

ELIMINATE bearing trouble. Our device absolutely eliminates carbon in oil. Cuts oil bills in half. For all model Fords. Price \$3.00. Write for particulars. Agents wanted. Snyder & Carson, Boyne Falls, Mich.

MIRRORS Resilver at home. Cost less 5 cents per square foot; you charge 75 cents. Immense profit plating auto parts, reflectors, tableware, stoves, refinishing metalware, etc. Outfits furnished. Details Free. Write Sprinkle, Plater, 128, Marion, Ind.

BE INDEPENDENT! Make, sell your own specialties. Immense profits. Catalog dependable formulas, special selected agents' best sellers. Free. M. Lusto, 832 East Pershing, Chicago.

ALL-YEAR-ROUND profitable business selling wonderful new water softener and cleaner. Removes grease, oil, ink and dirt quickly. Every home and business place a live prospect. 100% profit. Big repeat orders. Exclusive territory. Write for free sample. Seacoast Laboratories, Sea Bright, N. J.

AGENTS: Make \$500.00 monthly. Pay daily. No investment. Rhinestone initial buckles and novelties. Sell easy everywhere. Exclusive territory. Chaston Novelty Co., 606 Blue Island, Chicago.

SALESPEOPLE: Lynx Guaranteed Hose. Big variety, ladies', men's, children's. Prices very low. Big commission. Established six years. Easy sample outfit plan. Write Lynx Knitting Co., 16-22-M, Hudson St., New York.

AGENTS: Sensational profits taking orders for Taylor made-to-measure caps for men, and women's Bobette hats with purse to match. \$75 to \$150 every week. Pay in advance. We deliver. Outfit free. Write quick. Taylor Cap Manufacturers, Desk W78, Cincinnati, Ohio.

WE pay \$48 a week, furnish auto and expenses to introduce our soap and washing powder. Buss-Beach Company, Dept. A-42, Chippawa Falls, Wis.

32 SECONDS complete tire change by Detmer, Ohio, with Morey Quick Action Rim Tool. Sold, singly, 49 three days, cleared \$100. Anderson, Mont., sold 1400 in 14 weeks. Get details for good territory. Harvest time Now. M. Morey Rim Tool, Buffalo, N. Y.

THANXLY Formulas and processes produce perfect products. All kinds. All lines. Catalog, special circulars free. B. Thaxly Co., Washington, D. C.

NEW, Fast Seller: 150% profit; "Best-ever Powdered Hand Soap"; removes grease, paint, ink, dirt; great repeater. Sample Free. Bestever Prod. Co., 4319-P, Irving Park, Chicago.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, C4-805, Wheaton, Ill.

AGENTS: New invention, 100% profit. Money back guarantee; world's fastest seller; county distributors wanted. Fordchart Company, Milwaukee, Wis.

SEND name, address on postcard. Free introductory copy Salesology Magazine; contains 1,000 money-making opportunities. Offered by big reliable firms; no obligations. Salesology Magazine, Desk B-38, 500 No. Dearborn, Chicago.

FREE: Large wholesale specialty catalog, showing latest best sellers from many parts of the world. Sports Co., Lesueur Center, Minn.

AGENTS sell automobile radiator slag sets with 5 flags. Big money decoration day. Also good selling novelties for picnic celebrations. Write Unger Mfg. Co., 571 Harrison, Chicago.

EARN \$15 daily, pay advanced. Selling slickers \$10 value \$2.95. Striking colors. Outfit free. No deposit. Fisk Warner, 443 S. Dearborn, Chicago, Dept. A.

AGENTS, Hosiery Nulife, positively prevents run in silk hosiery, lingerie, etc. Every woman buys. Enormous profits. Write today. Wright Supply Co., Box 42, W. Orange, N. J.

GASOLINE Gauge for late model Fords. Installed at right end of instrument board. It tells—it sells. Dixon & Co., Box 603, Springfield, Ala.

IT'S New, different, startling! One agent sold 1800 Sterals first week; woman 300 town 900. No more decayed, diseased teeth from unprotected, infected toothbrushes; dentist invents patented airtight holder; cleans, dries, disinfects; simple, inexpensive, decorative. Every home buys Steral. Over 30,000 sold last month. Amazing details free. Security Mfg. Co., Dept. 25, Toledo, Ohio.

SOMETHING New. Every motorist a buyer of our electro-magnetic-emergency Wonderlamp; takes only one minute to demonstrate and make a sale; no experience necessary; \$5.00 an hour easily made, full time or evenings. Write for sample. Wonderlamp Co., 926 Fisk Bldg., Dept. 10-A, New York.

\$35 PROFIT on \$1.50 outfit. Gold transfer monograms; free sample. National Station D, Brooklyn, N. Y.

ARE You Old at Forty? See our advertisement on page 70 of this issue. The Electro Thermal Company, 2169 Main St., Steubenville, Ohio.

\$25.00 DAILY selling Raincoats and Slickers. \$2.95; newest colors, red, blue, green, etc. Outfit free. Commissions daily. Elliott Bradley, 241 VanBuren, Dept. 873, Chicago.

LANOWA Polishing cloth-mitten duster selling like wildfire. 200% profit. Hire subs. Write for sample and territory. Fraser Products, 305-J 43rd, Kansas City, Mo.

AGENTS—Men, women, big profits selling Veripure Vegetable Soap. Wonderful new soap for toilet, bath, etc. Write today. Veripure Laboratories, Box 998-C, Chicago.

SELL—Farm necessity for repairing sagging fences. Write Hawbaker Co., Elmore, Minn.

NEW: Just invented. Comb fastens anywhere. Send 10c for a 25c value. Never Lose Comb Mfg. Co., Lesueur Center, Minn.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

PORTRAIT Men! Largest frame and portrait house on coast; foreign shipments our specialty; twenty hour service. Victor Portrait Co., 223 Brush, Oakland, Calif.

GOLD-LEAF Sign Letters; make and sell; 1,000% profit. Johnston Co., Quincy, Ill.

AT Last! Diamond Rival Discovered! Amazing blue white Rajah Gem astounds jewelry world and deceives experts. Beautiful sample case free! \$100 weekly. Quick! Rajah Diamond Co., Dept. F20, Salisbury, N. C.

\$31.00 PROFIT—with \$1.50 Outfit—Big Money—Easy Work. Selling Gold Monograms for Automobiles, Luggage, Windows, Wagons. No Experience. No License. "Samples Free." NuLife Monograms, Hartford, Conn.

OUR New Household Device washes and dries windows, sweeps, cleans walls, scrubs, mops. Complete outfit costs less than brooms. Over half profit. Harper Brush Works, 132 3rd St., Fairfield, Iowa.

REAL Whirlwind Seller—Nopolout Custom Shirt. Every man buys them. Patented—no competition. Liberal commission. Free selling kit. Make \$15 up daily taking orders direct from consumer at manufacturer's prices. District or local agents. Write Nopolout Shirt Co., Dept. Y, Hazleton, Pa.

SELL absolute necessities. Cost 2c, sells 25c. Prices lowest. Seven different samples 30c. Catalog Free. Mills Sales Co., 13 East 16th St., New York.

MONEY Talks—You can have plenty of it selling—Amazing New Moth Bag. Absolutely air-tight. Never on market before. Sells on sight. Write today. Sta-Put Products Co., St. Louis, Mo.

AGENTS—Mosco Corn and Callous Remover will build you a steady repeat business. Send today for pocket size trial outfit. The Moss Co., 357 Searle Bldg., Rochester, N. Y.

EVERYBODY uses toilet preparations. Sell dainty, exquisite, delicately scented. Duo compacts, perfumes, powders, creams and lotions. Flavoring extracts and Specialties. Duo Co., TP-1, Attica, N. Y.

RADA-DIAMOND rivals the genuine diamond. Rich or poor buy them. Low price, fast sales, big profits. \$10,000 yearly for hustlers. Pocket case free. National Co., Box 1174-PM, Omaha, Nebr.

AGENTS. Get our prices on Coffee, Tea, Desserts, Soaps, Perfumes, etc. Endless variety, superb quality, quick service. Sample display free. Address Blair Laboratories, Lynchburg, Va.

MAKE Money selling E-Z Brite polishing cloths. Every office and home your prospect. Samples 25c. Excello Sales Co., Shreveport, La.

\$5,000 A YEAR—Selling Perry Photo Medallions. Big demand. Ready sales. 400% to 600% profits. Any photo copied perfectly on Medallions, Mirrors, Compacts, Jewelry, etc. Guaranteed likeness. Investigate. Free catalog, full details on request. Write Today. PM. Perry Photo Novelty Corp., 1793 Jerome Ave., New York.

\$500 MONTHLY advanced showing new colored Durotex slickers, \$10.00 value \$2.98. Beats all competition. Outfit Free. C. B. Clair, Dept. 106, 209 N. Washtenaw, Chicago.

REAL Profit Selling Purodol, new discovery for moth and insects. Season now, cash in on this greatest of all sellers. Spare or full time. 200 other famous products. 25c brings 50c can as demonstrator. Write. Read about Purodol. Jet Pharmacal Co., Allentown, Pa.

WE have a wonderful Combination Brush Set for the home. Five pieces. Ten uses. Costs less than \$3.00. 100% profit. Write 610 Bankers Reserve Life Bldg., Dept. 840, Omaha, Nebr.

NEW Invention: A walking stick and ukelele in one. Remove secret cover and cane becomes a uke. Introductory price \$3.50. Agents wanted. Uke-kane Mfg. Co., Broadway, Bayonne, N. J.

WHY Not sell us your spare time. \$2.00 an hour. \$19.70 daily easy full time. Introduce 12 months. Guaranteed hosiery, 47 styles, 39 colors for men, women, children, including latest "Silk to the Top" ladies' hose. No capital or experience needed. We furnish samples. Silk hose for your own use Free. M. H. Mathews, Road 3865, Cincinnati, Ohio.

AGENTS and District Managers: 250% profit selling exclusive, new process Artistic Signs. Hundreds of titles for every business. No competition. Write for details. Artistic Signs, 790R Broadway, New York.

WILLIAMS' Powdered Hand Soap has taken auto owners by storm. Cleans dirtiest hands instantly. Easy demonstration sells on sight. Free Sample and particulars. W. B. Williams, Inc., Dept. 266, Montclair, N. J.

1 AUTO Gas Saver Free. To introduce. All makes. Amazing mileage increase. Critchlow, C6-805, Wheaton, Ill.

MAN with auto; one day weekly; \$35. Bens, Woodside, N. Y.

33% SELLING Monogrammed Stationery and Everyday Greeting Cards. Write Herrings, 1224 N. 19th St., Philadelphia.

AGENTS: 500% profit. "Happy Home Make Shampoo" builds your own big business. Martin of Indiana made \$75.00 in one day. Missouri man made \$750.00 one month. Exclusive territory. Geo. A. Schmidt & Co., Dept. P, 236 W. North Ave., Chicago.

PHOTO Medallion Men and Women, the largest line of Photo Novelties in the world. Lowest prices, quickest service. Send for catalogue showing over 200 money makers, Photo medallions, photo medallion clocks, photo mirrors, photo fountain pens, photo powder compacts, photo jewelry and photo buttons. Gibson Photo Jewelry Co., 608-614 Gravesend Ave., Brooklyn, N. Y.

CAN you sell Ford size tires at \$3.50 each? Write for plan. Details free. American Accessories Co., Station 431, Cincinnati, Ohio.

100% PROFIT. 100 fast selling Brushes, dusters, mops and household necessities. Full or part time. Write for free offer. State age and experience. W. E. Kautenberg Co., Box 255P, Freeport, Ill.

THE best tooth-paste for Pyorrhea is Zi-O-Dine. Every tube guaranteed. Taste and cleansing qualities wonderful. Fifty cent tubes. Agents wanted. Iodine Products Co., Laurel, Miss.

AGENTS: Our gold-eyed Needle Cases are wonderful sellers; immense profits; \$50 to \$300 weekly; proof and particulars free; sample outfit 10c; factory prices. Paty Needle Co., 231 Davis Square, Somerville, Mass.

AGENTS make big money selling watch dog burglar alarms; retails for \$1.00; your profit 100%. Particulars free. Tuerk Mfg. Co., 32 No. Jefferson St., Chicago, Ill.

CALIFORNIA perfumed heads selling like hot cakes. Agents coining money. Big profits. Catalog free. Mission Factory P, 2328 W. Pico, Los Angeles, Calif.

OUR Luminous Crucifix Shines in the Dark. Every one amazed at the wonderful effect. Easily demonstrated. Easily sold. W. G. Hannan Co., Dept. B, 2539 So. State St., Chicago.

DISTRICT Managers—Agents: Capable men and women financially able to create and sustain branch office for new low-priced household necessity in big demand. Agents also wanted. For particulars write Pittsburgh Sanatory Supply, Inc., Wilkesburg, Pa.

AGENTS make \$3.00 an hour taking orders for our 40 Fascinating Kitchen Specialties. No competition. Write quick. General Products Co., Dept. 7-K, Newark, N. J.

MOCCASIN Manufacturer Wants Agents Everywhere to sell a complete line of moccasins to wearers. Entire new line. No competition, repeat orders. Get details. Daley Moccasin Co., Fort Covington, N. Y.

SELL men's neckwear; wonderful proposition. Astor, 318-M Broadway, New York.

DO you want good live agents—fellows who can get the business? Ask me how others are doing it. I'll gladly render the necessary assistance without cost to you. Address, M. L. Rund, Mgr. Classified Advertising, Popular Mechanics Magazine, Chicago.

NOVELTY bedspreads. Silk and cotton fabrics. Guaranteed. Reasonably priced. Every housewife wants one. Liberal territory and commission. Write Rainbow Novelty Mills, Grover, N. C.

WE Start You Without a Dollar. Soaps, Extracts, Perfumes, Toilet Goods. Experience unnecessary. Carnation Co., Dept. 2480, St. Louis.

SEND three references for Samples. 15 Hosiery Styles; 50 colors. \$10.00 Dinner Set Free to customers. S. Q. S. Desk D., Lexington, Ky.

NO Dull Times Selling Food. People must eat. Federal distributors make big money; \$3,000 yearly and up. No capital or experience needed; guaranteed sales; unsold goods may be returned. We furnish you with sample case, license and Free Samples for customers—Sure repeat orders. Exclusive territory. Ask now! Federal Pure Food Co., A2307 Archer, Chicago.

\$60-\$200 A WEEK. Genuine Gold Letters for store windows. Easily applied. Free samples. Liberal offer to general agents. Metallic Letter Co., 438-B North Clark, Chicago.

GOLD Sign Letters. \$9.75 for Thousand. Non-Tarnishable. Free sample. Catalogue. Atlas Sign Works, 1032 E. 55th St., Chicago.

AUTO owner tire agent wanted each locality to use and take orders for hand-made Mellinger cord and balloon tires; guarantee bond 15,000 miles; shipped prepaid on approval; get your tires free; no capital or experience required; make \$100 to \$300 weekly. Write for wholesale prices and sample kit. Address Mellinger Tire Co., Dept. 400, Kansas City, Mo., or Dept. 400, Philadelphia, Pa., or Dept. 400, Oakland, Calif.

DON'T Sell for others. Employ agents yourself. Make your own products. Toilet articles, household specialties, etc. 500% profit. We furnish everything and show you how. Valuable booklet free. Write at once, National Scientific Laboratories, 1958W Broad, Richmond, Va.

SELL "Fixit" Rubber Repair. Big pay. Doubles mileage of tires and tubes. Self-vulcanization without heat or tools. Big season now. Marquette, Z 2325 Wolfram, Chicago.

TURN Your extra minutes into extra dollars with our fast selling novelties and staples. Write for free information. Geo. B. Talbot Sales Co., Box 72L, Norwood, Mass.

AN Advantageous opportunity is offered capable man or woman representative, your vicinity, introducing Tiffany Hosiery and Lingerie direct from mill to wearers. Steady work assuring good income. Tiffany Silk Company, 220 Fifth Av., Suite 2532, New York.

NEW Invention, big seller, 400% profit. Liquid quick mend for hosiery and fabrics. Every woman buys. Hundred other fast sellers. J. E. Johnson Co., Dept. 453, 6145 Wentworth Ave., Chicago.

NEW Invention ends window washing drudgery; eliminates buckets, brushes, rags, sponges; 75% quicker; once over cleans, once again dries; keeps hands dry; 175% profit. Selling \$150; catalog free. Lady Jane Mfg. Co., Dept. 65, Toledo, Ohio.

WANT a plan that will sell 9 out of 10? A nationally known line of 200 articles. Write for particulars and \$10 free sample case. H. Smith, Mgr., 1223 Wash-bash, Chicago.

DIRECT Factory representatives for changeable letter window display signs. Good income assured. Experience unnecessary. Maze Manufacturing Co., Norwood Station, Chicago.

EASY to sell to every merchant. Good profits. Repents. Two sizes, glassed or unglazed. Write Embossed Show Card Co., 9474 Euclid Ave., Cleveland, Ohio.

MEN Wanted to make \$25.00 day selling hosiery from reliable house. Men's rayon hose, \$12.00 gross; men's fancy silk, \$21.00 gross; neckwear, \$12.00 gross. Write for above three gross, catalog, or 3 sample dozens; enclose \$3.75 for samples. Lewis Hosiery Company, 12 N. 3rd St., Philadelphia, Pa.

WOULD \$100.00 per week interest you? Millions of photos all over the country just crying to be made into beautiful artistic medallions. We have new plan. Lowest prices. Speed service. Experienced agents losing money every day they put off writing us. Art Medallion Co., Dept. T, Corner Campbell and Jackson, Chicago, Ill.

75c PROFIT on \$1.00 sale. Auto furniture and glass cleaner. Your name on label. Exclusive rights; free sample. Mfg. E, 213 Griswold, Detroit, Mich.

IT'S The cat's meow. Brand new novelty. Biggest seller on earth. Sample and wholesale prices 25c. Novelties, Box 10, Mt. Washington, Ohio.

AGENTS—Just like striking an oil well. New money-making advertising specialty. Particulars free. Suburban, Box 10, Mt. Washington, Ohio.

BIG Money easily made without peddling or outfits. Free particulars. Elite, 38 Elizabeth St., New York.

AGENTS to sell to dealers or consumers paying big. Dowlings Improved Headlight Shades for all cars. Box 506, Yankton, S. Dak.

AMAZING Vaporizer! Tests show gasoline mileage increased 63%! Free display newspaper advertising. 10 easy sales daily, profit \$1,000 month. Exclusive territory. Hurry! L. Phillips Mfg., St. Louis, Mo.

MAKE big money selling old established line popular priced beauty creations, food products and medicines. Over 100 every-day necessities. Pay 100% profit. Everyone guaranteed. Backed by \$8,000,000 organization. Particulars free. Write The Tru-San Company, Dept. "P.M." Memphis, Tenn.

AGENTS: Great household tool, 7 tools in 1; for homes, campers, etc. Other specialties. Write Girard-McIntosh Mfg. Co., Washingtonville, Ohio.

OUR Agents average better than \$75 a week; Rich's pure fruit soft drink powders. Every home, store, drink dealer buys. Sample free. Sol P. Rich Co., 622 S. Sangamon, Chicago.

SELL Surety, the original, genuine, powdered hand soap, and make \$5,000 yearly. We furnish sales plans, advertising and free samples. Write quick. Surety Mfg. Co., Dept. 56, 26 W. Washington St., Chicago.

HAIR Tonic—Concentrated. Add water and bottle. Labels free. Outfit for 36 dollar bottles, postpaid \$1.00. Casey, 1043 Washington, Boston, Mass.

AGENTS—Mac's liniment (liquid mustard plaster) for coughs, rheumatism; Mac's Black Lotion for pyorrhea, wounds, sore gums, piles. Mac Chemical Corp., 74-A West St., New York.

SIMPLEX Vaporizer, 25 to 60% increased mileage guaranteed. Retail \$1. Thirty days free trial. Exclusive territory. American Fixture Co., 234 West Water, Milwaukee, Wis.

"LIQUID-LEATHER" Fills Holes in Shoes, Rubbers, Tires. Dries Instantly. Pliable, Waterproof. Just imported from France. Tube Retail 75¢—Cost 35¢. Sells Housewives, Sub-Agents. Nullife Leather, Hartford, Conn.

REMNANT Store, Bethel, Ohio. Greatest Dry Goods Bargains on Earth. Agents and Dealers.

AGENTS—Clever Invention! Inkspoon makes every pen a fountain pen. Fast office seller; big profit, demand increasing everywhere. Exclusive territory offered. Sample free. H. Marul Company, Tribune Bldg., New York, N. Y.

EARN \$10 daily silvering mirrors, plating and refinishing metalware, autos, chandeliers, bedsteads, headlights. Outfits furnished. E. Decle Laboratories, 1133 Broadway, New York.

AGENTS—Make a dollar an hour. Sell Mendets, a patent patch for instantly mending leaks in all utensils. Sample package free. Collette Mfg. Co., Dept. 404, Amsterdam, N. Y.

AGENTS—Send for Free Sample "Fret-not" Washday Wonder. Big Profit. You don't have to talk; if she doesn't buy at sight, leave sample. Exclusive territory. Credit given. Empire Specialties Co., 1549 N. Wells, Dept. 101, Chicago.

AGENTS make \$100 week placing advertising Cigar Lighters with glass front. Every dealer wants one. Write for free plan. Drake Mfg. Co., Dept. M, Milwaukee, Wis.

BIG Profits. Sell "No-Splash" 4-Strainer Water Filters. Fast sales, lowest prices; send for 6 dozen, \$1.80 postpaid. Jones Mfg. Co., 243E Franklin St., Boston, Mass.

FREE Sample. "Rain Shield Wiper." Retail \$1.00—Cost (25 cents). Sold Clear and Rainy Days. No Cloth—No Paste—No Attachment. (1) Rub keeps windshield clear 48 hours. Experience Unnecessary. NuLife Corporation, Hartford, Conn.

A WONDERFUL proposition for crew managers and house-to-house workers, either sex, selling Great Stuff "Brush On" Cleaners, Great Stuff Products, Minneapolis, Minn.

AGENTS—Stamping names on Pocket Key Protectors; sample Check with your name and address. 25¢. Stamping Outfits, Emblem Checks, Check Fobs, Name Plates. Hart Mfg. Co., Desk 2, 303 Degraw St., Brooklyn, N. Y.

ONE of the biggest mails on earth. Sent to any address for 10¢. Louisiana Distributing Service, Dept. PM Harmon, La.

SELLING Like Blazes! Eleven piece toilet goods assortment at \$2.25 with two-piece carving set free to your customers. 100% profit. Davis Products Co., Dept. 56, 1321 Carroll, Chicago.

ARTIFICIAL Stone Houses, \$100! (Patent pending). Healthful, everlasting. Scientific American says. Agents' bonanza. D. Bradley, Box 1586, Cincinnati.

AGENTS—Sell 5¢ fast selling candy specialties to stores. Big profits. Lorrac Products Co., Albany, N. Y.

A BUSINESS of Your Own—Making Sparkling Glass Name and Number Plates, Checkers, Signs. Big Book and Sample Free. E. Palmer, 512 Wooster, Ohio.

AGENTS—New Plan, makes it easy to earn \$50.00 to \$100.00 weekly, selling shirts direct to wearer. No capital or experience needed. Represent a real manufacturer. Write now for Free Samples, Madison Company, 566 Broadway, New York.

GET Our Free Sample Case—Toilet articles, perfumes and specialties. Wonderfully profitable. La Derma Co., Dept. A, St. Louis, Mo.

BIG Money and Fast Sales. Every owner buys Gold Initials for his auto. You charge \$1.50; make \$1.35. Ten orders a day easy. Write for particulars and free samples. American Monogram Co., Dept. 40, East Orange, N. J.

AGENTS—Steady income. Large manufacturer of handkerchiefs and dress goods, etc., wishes representative in each locality. Factory to consumer. Big profits, honest goods. Credit given. Send for particulars. Freepart Mfg. Co., 59 Main St., Brooklyn, N. Y.

POLMET—The Wonderful Polishing Cloth that cleans all metals without liquid, paste or powder. Approved by "Good Housekeeping" and "Modern Priscilla"—sells fast at 25¢. Sample free. Gale & Co., Inc., 15 Edinboro St., Boston.

MAN in each town to plate auto parts, reflectors, bathroom fixtures, refinish beds, mirrors, chandeliers; by new method. No capital or experience required. Simple plan of manufacturing at home starts you in big money-making business. Outfit furnished. Free particulars and proofs. Gun Metal Co., Ave. H, Decatur, Ill.

REPLATE brass worn-off Automobile parts, Reflectors, Bath Room Fixtures, Worn Spoons, Forks, etc., with pure silver. Looks like new. Use U-Kan-Plate Polish. Positively no mercury. \$1.00 half pints. Post Paid. Satisfaction Guaranteed. Agents wanted. Dept. A, U-Kan-Plate Co., Philadelphia.

AUTOMOBILE Specialties. Guaranteed formulas for all latest money makers. Low-cost prices. Write for free lists. Murphy, Chemist, Tujunga, Calif.

OVER 100% Profit. Self Lighting Gas and Cigar Lighters; Everybody interested, repeat business. Sell individuals, dealers, subagents. Particulars Free. P. Bernhardt, 127 West 30th St., New York.

AGENTS—N-R-G Laundry Tablets, the old reliable money-maker for live agents. Millions sold—200% profit—sales waiting for you. Clothes washed spotlessly clean in 10 minutes without rubbing. Free samples. N-R-G Company, 230 W. Superior, Chicago.

WANTED—County representatives to market 3A garage Door Holders. Simple Automatic Action instantly attracts Garage Owners, Builders, etc. Write for attractive proposition. Knowlson-Stevenson Company, Ann Arbor, Michigan.

NEW Camera. Regular black and white photos finished quickly inside camera. Make money selling cameras, taking photos or doing both. Crown Company, Dept. 481, Norwalk, Conn.

MAGIC Polishing Cloth—great seller—big profit. Try this cloth—it's a money-maker. Full size samples free. Get this proposition. Newton Co., 166 Main St., Newark, New York.

KLEENZIT Kleenex Pencil Removes spots and stains from men's garments and similar fabrics. Simply mark spot with cleaning crayon and erase with brush-pad moistened with water. Sells readily at 35¢ to 50¢. Big profit. Sample 25¢. Argyle Specialty Co., Arvyle, Wis.

EVERY Woman Wants a Sewing Set. Home Sewing Sets contain 112 useful sewing articles, \$4 an hour easily made with this 50¢ seller. Prentice-Lee, 145 East 23rd St., New York.

BIG Profits: Steady Income our line food products, toilet articles, soaps. No cash or experience needed. Sample case free. Write Linro Co., Dept. 243, St. Louis, Mo.

OH, Hello! why didn't I see this before. Christy's Iron Rust and Stain Remover sells like blazes. Write for free sample. Christy, Inc., 5067 Lakeway, Newark, New York.

\$50.00 WEEKLY easy. Applying Gold Initials on Automobiles. No experience needed. \$1.45 profit every \$1.50 job. Free Samples. "Ralco Monograms," 1043 Washington, Boston, Mass.

MAKE \$10 a day without selling. New plan. We send customers to you for greatest gas saver. Cuts gas bills 25%, guaranteed. Gives motor more pep and power. Removes carbon. Positively no cold turkey work. We have perfected a plan that sends you buyers as fast as you can handle them. Big Money, easy. Write today for complete plan. Mae Auto Products Company, Dept. 505, 6355 Broadway, Chicago.

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

WANT Producing Agents and salesmen? See advertisement under Advertising Agencies, page 49. Frank W. Lenhoff Advertising Agency, Chicago.

AGENTS—Spring Grip Stropper. Hundreds of velvety shaves from one blade. Send 50¢ for \$1.00 sample outfit, including leather stropper. Spring Grip Stropper Co., 20 E. 31st, Kansas City, Mo.

AGENTS—Build permanent business with our gold sign letters. Easy work. Big profits. Samples free. Acme Sign Letter Co., 312 Dunn St., Sta. R, Cincinnati.

NO difference what you're selling, you can increase your sales 500% by giving our \$1000 policies as free premiums. Costs you nothing. Write National, 715-M Baltimore Bldg., Chicago.

MAKE \$200 a week selling motorists Britelite, the lamp of a thousand uses. Complete with ten-foot cable. Clip to battery terminals on any ignition wire. Electro-magnet in lamp base sticks to any metal surface. Use as trouble lamp, emergency head or tail light, etc. Price \$3. You make \$1. Send \$2 for sample. Money refunded within 10 days if dissatisfied. Sample free on first order of six or more. National Electric Products Corp., 8-M Centre St., Newark, N. J.

AGENTS—Men-Women, get in big-money class; world's fastest sellers and repeaters. permanent increasing business; our method creates immediate demand; workers make \$200 month up. Write immediately; samples, particulars free. Dr. Carmack Laboratories, Columbus, Ohio.

POSITIVELY the best low-priced specialties for hustling agents. Hardware and general stores, paint shops, garages and citizens all welcome these articles. Many repeat orders. Write, describing territory desired. H. Dill, Mfr's Agt., 716 Little Bldg., Boston, Mass.

AGENTS Sell 2000 cards for \$3.75. Commission in advance. Many other printing specialties. Specialty Printers, Buckeye St., Dayton, Ohio.

REAL Money selling Great Stuff Concentrated Hand Cleaner to mechanics, machinists, printers, etc. Entirely different! Sold in the dry form. User makes the paste by adding water. Cuts cost in half. Big profit. Dime brings regular package and particulars. Great Stuff Products, Minneapolis, Minn.

WONDERFUL New automobile vaporizer. Want agents. "Rait," 2711 Dupont, South, Minneapolis, Minn.

REAL Money for you. Our combination aluminum cooking set easy to sell. No delivering, no collecting. Make \$10 to \$15 daily. Espy-Riddle Company, Dept. 2, 2325 Carson St., Pittsburgh, Pa.

CASH Paid for Butterflies, Insects. See Sinclair Display Advertisement on Page 22.

HIGH-GRADE SALESMEN WANTED

TOOL Salesmen calling on repair shops and garages to handle special priced tools. Piston Ring Expander, Piston Ring Groove, Carbon Remover and Valve Lock Tool. These tools are endorsed by leading automobile manufacturer and flat rate experts. Each tool is patented and is a garage necessity, are very easily sold and are all guaranteed by the manufacturer. Advise us what line you are selling and territory covered. Only men actually calling on garages with an established trade desired. The Art Tool Manufacturing Company, Cleveland, Ohio, Dept. A.

WANTED—Tailoring Salesmen, make \$60 to \$125 per week. We are the largest made-to-measure tailoring house in the country, furnishing elaborate sample equipment. Over 150 all wool fabrics sell at \$23.50, \$29.50, \$34.50 and \$43.50 which includes commissions of \$3.50 to \$8.50 and bonus. Guaranteed absolute satisfaction, perfect fit, best workmanship, or no sale. We maintain an absolute 6-day delivery schedule. Write for our line and all accessories to be sent free. Tell us all about yourself. Edward E. Strauss & Co., Inc., Dept. 101, 402 So. Market St., Chicago.

\$91.50 WEEKLY and up. Your pay daily, introducing new 12 months insured hosiery for men, women and children. You write orders. We deliver and collect (or goods on credit and you can deliver, suit yourself). No experience or capital needed. Samples furnished. All colors, grades, including silks, lises, chiffons, heathers. Write quick. Maccohee Textile Company, Road 3045, Cincinnati, Ohio.

WE Want to add to our sales force ten men who are capable of earning \$10,000 a year. For particulars write Tunnell Map Co., Goshen, Ind.

MR. BRUSH Salesmen—Old Established New York brush manufacturers require services of men in all territories to sell their extensive line of Sanitary Twisted Wire Brushes. We pay larger commission than any other brush house in the country. Write immediately for our proposition. Wire Grip Sanitary Brush Corporation, 15 Mercer St., New York.

NEW Advertising Novelty. "Oil-Memo" clamps on dash of auto. Big money-maker. Live-wire salesmen wanted. Full time or side-line. Strictly commission basis. Free samples. Give references or experience in first letter. Jubilee Mfg. Co., 36 Sta. C, Omaha, Nebr.

CAPABLE salesmen organizer. Good references. Ask about district manager proposition. Permanent, interesting work. Same territory. Your own business. Big annual income. Fairview Nurseries, Dept. MC, Geneva, N. Y.

BIG, steady yearly income, selling Souvenir advertising pencils. Oldest, largest manufacturer. Our quality, prices mean your sale, repeat business. Reliable men given steady positions. No dull season. Souvenir Lead Pencil Co., Dept. E-5, Cedar Rapids, Iowa.

EARN \$20 a day. Establish income for life selling for \$1 a year \$1,000 accident policy. Write W. C. Stone, A-11 So. La-Salle, Chicago.

OFFICE specialty salesmen wanted. Exclusive agencies. Dobb Manufacturing Company, Minneapolis.

SPECIALTY Salesman qualified for position making \$1,000 monthly. New electric sign. Extends 4 feet over sidewalk. Illuminated letters and border. Selling on sight at \$25. Big commission. Flashtrac, 2126 Hudson, Dept. P, Chicago.

PUNCHBOARD Salesmen, take notice. New, fascinating game excitement. Can be used all states. \$200 weekly easy. One minute sales talk. Pay daily. Cigar Stores Novelty Co., Dept. G, Peoria, Ill.

SALESMEN—Biggest money-maker. Just out. Particulars free. Ebollyn, 4833F Polk, Chicago.

GOLD Leaf window letters and script signs. No experience; 500% profit. Samples free. Consolidated, 690-V West Van Buren, Chicago.

SPECIALTY Salesman wanted. Big commissions being earned selling Ever-Ready cans. Write for particulars. Ever-Ready Can Company, Greenfield, Ohio.

SALESMEN, If \$50 weekly extra money and a blue serge suit free interests you, write today. Desk 19, Tru-Blu Tailors, 2043 72nd St., Brooklyn.

SEND name, address on postcard. Free introductory copy Salesology Magazine; contains 1,000 money making opportunities. Offered by big reliable firms; no obligations. Salesology Magazine, Desk B-39, 500 No. Dearborn, Chicago.

BIG Season Just Ahead—Advertising Pencils more popular every day—every business prospect—our line repeats—Big commission—Established 1902. North American Pencil Works, 128-AB, So. Clinton, Chicago.

SALESMEN—If you want to get into a real money-making business, and help people at the same time, sell Radiumized Health Products. Exclusive territory, \$6.50 profit every sale. Write Radiumized Applicator Co., 1303-P Fillmore, Buffalo, N. Y.

WILL You wear a pair of genuine tailor-made shoes at my expense? Will you show them to your friends and take their order? I will also send you free our big selling outfit showing 70 shoe styles and 60 actual leather samples. I pay my agents \$8.00 daily. Write quick. Tailor-made Shoe System, 932 Wrightwood, Dept. 163, Chicago.

\$5000.00—ARE you making less per annum? If so we have a sales opening for you. Sell auto and tractor oils to farming trade. Write for particulars. The Lennox Oil & Paint Company, Dept. Sales, Cleveland, Ohio.

GREAT neckwear line now free! Features finest quality neckwear at factory prices. Collect big commissions daily. Write for free tie offer and free outfit. Nawco Neckwear, Desk 5-B, Covington, Ky.

BECOME your home town's leading business man. Big money. Selling groceries, coffee, canned goods, auto oils direct to consumer. Exclusive territory. Undersell competition. Free sample case. Commission advanced. Liberal credit. No experience or capital necessary. Loverin & Browne, E-1615 So. State, Chicago.

SALESMEN—Get free outfit and make \$90 a week taking orders for famous Taylor rain-proof, made-to-measure caps and knickers for men. Also eight other big profit-makers. Commission in advance. We deliver. Taylor Cap Manufacturers, Desk W79, Cincinnati, Ohio.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

SALESMEN—Our patent adjustable auto fanbelts; 2 sizes make dealer's complete stock. Fastest seller out. If you travel by car, write quick. Herman Mfg. Co., 1312 Ninth, Washington, D. C.

PAVED Road Maps—Handy, inexpensive for advertising and premiums. Sell on sight. Full or sideline. Proposition, samples on request. George F. Cram Company, Indianapolis.

TOOL Salesmen—Write for details new design pocket size gear puller. Very useful, attractive, reasonable. Mechanics buy quick. Lellin Company, 388 Burnside, Portland, Oreg.

WANT Producing salesmen and agents? See advertisement under Advertising Agencies, page 49. Frank W. Lenhoff Advertising Agency, Chicago.

DISTRIBUTORS—\$100.00 weekly. Sell Sur-Go Corn Remover display easels to stores. Fast repeats. Exclusive territory. Grab this. Tyrrell Products, 904 First, Martins Ferry, Ohio.

MEN—Sell dependable shrubbery, fruit trees, etc. Steady demand. Complete co-operation. Commissions paid weekly. We deliver and collect. Write Perry Nurseries, Dept. R-5, Rochester, N. Y.

DISTRICT Managers: 16 hosiery styles, 10 lingerie styles; over 60 colors. We deliver. \$10.00 sample outfit furnished to representatives (no deposit); 10% bonus. Premium to customer. Advertising and office allowance. Send three references, stating experience, to see Samples Dept. G, S. Q. S., Lexington, Ky.

SEE Davis Co's advertisement under "Business Opportunities" in this section.

TAKE orders for coffee, flour, dried fruits, canned goods, staple groceries, toilet articles, paints, radio sets, auto and tractor oils. No capital or bond required. We deliver and collect. Permanent business. Big pay. Write at once. Hitchcock-Hill Co., Dept. 50, Chicago.

DISTRICT Managers—To handle established business on all Patented Products. Not sold in stores. Big commissions. Write today. Sta-Put Products Co., Sales Dept., St. Louis, Mo.

MOTION—Color—Light plus changeable letter system make ours the last word in window salesmen. Actually boosts sales 200% to 400%. Every show window means an interested prospect. Get the facts and start pocketing \$100 weekly. Display Products Company, A409 East 31st, Kansas City, Mo.

TOOL Salesmen—Mechanics—Distribute guaranteed line auto repair tools. Exclusive business of your own. Show 71 samples in case. Big commissions. Quality Tools Corporation, New Wilmington, Pa.

SALESMEN Wanted—To sell our West Virginia grown nursery stock. Fine canvassing outfit free. Cash commission paid weekly. Write for terms. The Gold Nursery Co., Mason City, W. Va.

ATTENTION! Up to 40% commission in cash as you take orders. Every business man buys printing; big money-maker, side line or specializing; no experience necessary; free sample book, particulars. Write now to the largest mail-order printing concern in the west if you want more money and mean business. Advance Printing Co., 122 W. 3d St., Los Angeles, Calif.

SALESMEN—Become Independent. Own Your business, experience unnecessary selling our \$7,500.00 Accidental Death; \$50 Accident; \$25 Sick Weekly Benefits—\$12.50 Yearly. Other Amounts proportionate. Guaranteed steady income from renewals. \$250.000 Deposited Insurance Department. Universal Policy, Dept. A, 30 Clinton St., Newark, N. J.

MILLIONS of business men waiting for Brand New indispensable \$10.00 office utility saving hundreds of dollars annually. One man sold sixteen in three hours. Splendid profits. Write quick for trial offer and exclusive Virgin territory. Lightning Calculator Co., Dept. FT, Grand Rapids, Mich.

COLLECTS Money from the Dead-Beats. Retail \$5.00—Cost \$1.00—Profit \$4.00. "New Method." Every Storekeeper, Doctor buys quickly. Wonderful Money Getter. Federal Association, Hartford, Conn.

SALESMEN—Are You Making Enough Money? Let us show you how to make Big Profits with Jiffy Washing Tablets. No experience required. Write for Free Sample and Plans. Jiffy Soap Products Co., Dept. A, Dayton, Ohio.

TRAVELING Salesmen Calling on Retail Stores wanted by large manufacturer of fast-selling specialties entirely different from the average. Year-round sales, main or sideline. Big commission paid immediately on original and repeat business. Opportunity for well paid and permanent connection with old-established firm. If not making \$150 weekly, write today. Union Specialty Works, Dept. 222, Booneville, N. Y.

\$60-\$200 A WEEK. Genuine Gold Letters for store windows. Easily applied. Free samples. Liberal offer to general agents. Metallic Letter Co., 438-A North Clark, Chicago.

FOUR \$7.50 sales to merchants net you \$20.00 daily. Sayers Systems, 2803 Sheffield Ave., Chicago, Ill.

ANY Salesmen Can Sell Them! Merchants everywhere use punchboards. Someone sells them, why not you? Collect big commissions daily. Newest, largest, elaborate catalog sent upon request. Lincoln Sales Co., 9 So. Clinton, Chicago, Dept. D.

75c PROFIT on \$1.00 sale. Auto furniture and glass cleaner. Your name on label. Exclusive rights; free sample. Mfg. E. 213 Griswold, Detroit, Mich.

HELP WANTED

TAILORING Salesman for Emerson Master Built suits and topcoats. Finest tailoring at \$23.50, \$28.50, \$36.50 and \$42.50; profits \$3.50 to \$7.00, plus bonus. 150 samples—special serge leaders. Protected territory. Leads and prospects developed through unique sales plan. Write fully, include 3 references for quick action. Emerson Wholesale Tailors, Dept. 1002, 635-7 Arch St., Philadelphia, Pa.

MAN Wanted to represent old established manufacturer. (City or country). Those selected become dealers in 175 household necessities which everybody buys again and again. We extend credit and show you how to develop a paying business of your own. Experience unnecessary. President, McConnon & Co., Dept. X6, Winona, Minn.

U. S. GOVERNMENT jobs. Become railway postal clerks (\$150-\$225 monthly); city carriers, postoffice clerks (\$142-\$192 monthly); rural carriers (\$175-\$255 monthly). Men 18 up. Steady work. Paid vacation. Common education sufficient. Experience unnecessary. Sample coaching and full particulars free. Write today sure. Franklin Institute, Dept. J-3, Rochester, N. Y.

IMMENSE profits silvering mirrors at home. Plating autoprots, headlights, tableware, stoves, etc. Outfits furnished. Details free. Write Sprinkle, Plater, 287, Marion, Ind.

BEGINNERS coached for hotels, beaches, mountains, Florida. Fares paid. Write Richard Lee, Drawer 1508, Boston.

MEN, Qualify for forest ranger job; \$125-\$200 month and home furnished; permanent; hunt, fish, trap. For details write Norton, 226 McMann Bldg., Denver, Colo.

U. S. GOVERNMENT wants men. \$1,700-\$1,900 and up at start. Railway Mail clerk examination coming. Let our expert (former Government examiner) prepare you for this and also Rural Carrier, Post Office, Customs, Internal Revenue, and other branches. Write today for free booklet. Dept. 8, Patterson School, Rochester, N. Y.

WOULD You risk a 1c postal against the chance to make \$5 to \$15 in spare time with an absolutely new line of insured hostlers, guaranteed 12 months. Your pay daily. Monthly bonus extra. Magnificent sample outfit furnished. If so, send name and address now to Maccohee Textile Company, Road 2605, Cincinnati, Ohio.

TRAVEL. \$158 month. Railway postal clerks. Men, 18 up. 25 coached free. Write immediately. Franklin Institute, Dept. J16, Rochester, N. Y.

START a manufacturing business of your own. Earn \$100 weekly. Make your own products. Formulas, toilet articles, perfumes, soap, extracts, etc. We furnish everything and show you how. Valuable booklet free. National Scientific Laboratories, 1960W Broad, Richmond, Va.

WANTED—Men to learn radio; Free information. Wallace Radio School, Oklahoma City, Okla.

SEE Davis Co.'s advertisement under "Business Opportunities" in this section.

\$35.00 WEEK. Boys, men wanted. Learn auto repairing. Sample lessons free. Franklin Institute, Dept. J400, Rochester, N. Y.

GOVERNMENT positions pay \$35 to \$75 weekly. We help you get them. Big List Free. Write, Mr. Ozment, 101, St. Louis Mo.

EARN \$10 daily silvering mirrors, plating and refinishing metalware, auto, chandeliers, bedsteads, headlights. Outfits furnished. E. Decie Laboratories, 1133 Broadway, New York.

TRAVEL—See your country. \$1900 year. Men 18 to 35. Become railway postal clerks. Steady work. 25 coached free. Write immediately. Franklin Institute, Dept. J16, Rochester, N. Y.

BECOME a Landscape Architect. Uncrowded profession of wonderful opportunity for money-making. Easily mastered by mail. Earn while you learn. Write for book. American Landscape School, 56-E, Newark, N. Y.

SILVERING Mirrors, French Plate. Easily learned; immense profits. Plans free. Wear Mirror Works, Excelsior Springs, Mo.

ARE You Old at Forty? See our advertisement on page 70 of this issue. The Electro Thermal Company, 2169 Main St., Steubenville, Ohio.

SEND name, address on postcard. Free introductory copy Salesology Magazine; contains 1,000 money-making opportunities. Offered by big reliable firms; no obligations. Salesology Magazine, Desk B-40, 500 No. Dearborn, Chicago.

CASH paid for butterflies, insects. See Sinclair Display Advertisement on Page 22.

MEN to train for locomotive firemen on railroads nearest their homes—everywhere; beginners \$150-\$250 monthly; promoted, locomotive engineer, \$3,000-\$4,000 yearly. Best paying positions on railroads. Railway Association, Desk M1, Brooklyn, N. Y.

STEAMSHIP Positions, Europe, orient, etc. Good pay; experience unnecessary. We help you to secure them. Write for free application form. Box 30-A, Mount Vernon, N. Y.

GOOD Profits. Send 25c cartoon lesson \$1.00. GPO, Box 471, New York.

MAILING LISTS

99% GUARANTEED Mailing Lists. Accurate. Reliable. Guaranteed. The kind that produces business; compiled for every possible business or individual. Lists of every kind of any business or individuals compiled for your individual needs anywhere. Catalog and information on request. National List, 847 Broad, Newark, N. J.

NAMES 700 mothers of new babies, not over 10 days old. \$1.00 hundred. Interstate Company, Box 700, Minneapolis, Minn.

300 SELECTED buyers \$1.00. Individually compiled. Trunkat's, NS, 1418 Claim St., Pittsburgh, Pa.

1,000 NAMES. \$1.00. Mention Classification. Wineholt Sales Co., Woodbine, Penna.

LETTER SPECIALISTS

LETTERS that collect old accounts. \$5. A. H. Lofgren, Cook, Minn.

RESULT-GETTING Letters, \$5. Heart-Inger System, 2202 Wyoming, St. Louis, Mo.

BUSINESS SERVICE

NEW YORK address, \$3. Broadway Service Co., 42 Broadway.

CAPITAL—Any amount—Raised by new successful plan. Percentage basis. Morris, Financing Specialist, 3608 Warren St., Philadelphia.

ACCOUNTS, Notes, claims collected everywhere. No charges unless collected. May's Collection Agency, Somerset, Ky.

TYPEWRITERS AND SUPPLIES

TYPEWRITERS, all standard makes, thoroughly re-manufactured by the famous "Young Process" and shipped direct from factory to you on 10 days' trial. Guaranteed 5 years. Easy monthly payments. Write today for free catalog. Young Typewriter Company, Dept. 5755, 654 W. Randolph St., Chicago.

UNDERWOOD Typewriters—only \$3.00 down. Easy monthly payments. Low prices at less than manufacturers, 10 days' free trial. Rebuilt, all worn parts replaced. Just like a new machine. 5-year guarantee. Write for a big free catalog B-151, Shipman-Ward Mfg. Co., 1515 Shipman Bldg., Chicago, Ill.

100 TYPEWRITERS Free. Overstocked. Rent Rebuilt Underwood or Remington \$3.00 month. If you pay its value in rental, we give machine free. Particulars free. Pittsburgh Typewriter Exchange, 945 Hersch Bldg., Pittsburgh, Pa.

TYPEWRITERS, all standard makes. \$10 up. Fully guaranteed. Free trial. Write for complete illustrated lists. Northwestern Typewriter Exchange, 121 N. Francisco Ave., Chicago.

TYPEWRITERS, Motorcycles, Radios, \$5-\$35. Knight's, 15th & Locust St., St. Louis, Mo.

TYPEWRITERS: All makes; lowest prices; 5 year guarantee; send for illustrated catalog. Henry Typewriter Co., 215 West 125th., New York.

PRINTING, ENGRAVING AND MULTIGRAPH

COMBINATION Printing offer. 500 letterheads, 500 billboards, 500 statements, 500 envelopes, 500 business cards; all 5 items. \$9.50. Better Printing Co., Inc., 217 W. Illinois, Chicago.

PRINTING—Small orders our specialty. First class work guaranteed. Established 1883. Press-Progress Printery, Rockford, Ohio.

1000 LETTERHEADS, 1000 envelopes, complete, \$6, cash. H. B. Adams, Penns Grove, N. J.

50 LETTERHEADS, Envelopes, dollar. Rapidservice, Box 413, Mount Vernon, Ohio.

"NEARGRAVURE" Neargravuremboso, lithography processes. Different, unique, exquisite, distinctive. Samples. Solidays, Knox, Ind.

CIRCULARS 5,000 5 1/2 x 8 1/2 \$11. 3 1/2 x 6 four-page folders, \$14. All printing lowest prices. Samples. Garrison Press, Harrisonburg, Va.

100 CALLING cards and genuine leather case \$2.00; over one line 10c line extra. 200 standard business cards \$1.00; over 5 lines 10c line extra. Sample for stamps. Business Card Specialty Co., Q552, Jackson, Mich.

250 LETTERHEADS, 250 Envelopes—Bond, \$3.00. Arrow Press, Kankakee, Ill.

250 BOND Letterheads, Envelopes, Billheads, Cards, \$1.35 each. Economic Press, Leonia, N. J.

250 EACH Hammermill Bond Letterheads, Envelopes, \$3.00. Samples. Midland Press, 543 West Hickory, Kankakee, Ill.

\$3.00 DELIVERED. 500 watermarked bond letterheads, bill heads or statements and 250 envelopes. Money with order. Lowest price all printing. National Printing, Goshen, Ind.

TRY To beat these prices. 5000 letterheads, 20 lb. Hammermill bond, \$11.25; 5000 3X envelopes, \$8.75. Other prices and samples on request. The Low Cost Printers, 121 West 21st., New York.

1000 6 1/2 WHITE envelopes printed, \$2.35; 5000, \$8.85; letterheads, 1000, \$2.95. Sports Printery, Lesueur Center, Minn.

CIRCULAR Letters multigraphed on your letterheads, 500, \$3.75; 1000, \$5.00. Stevenson, 4027 Darien, Philadelphia.

150 8 1/2 x 11 HAMMERMILL Bond letterheads, envelopes, billheads or business cards, \$1.00, postpaid. Race Printing Co., Hudson, N. Y.

FREE Card Case with your name in gold with each order of calling or business cards. Bookful 25c. Samples free. Agents wanted. Good commission. All other printing at the cheapest prices. Mail Order Printing Co., 3702 Oregon, St. Louis, Mo.

MAKE your own stencil duplicator, Hektograph, printing cuts. Simple, efficient, inexpensive. Three guaranteed processes \$1. Boyd Hayes, Pegram, Tenn.

STATIONERY Printing Deluxe. Samples free. Industrial Press, Jefferson City, Mo.

250 HAMMERMILL bond letterheads or envelopes, \$1.25; 500, \$1.85; 1000, \$2.75. (Distinctive kind). News, Isanti, Minn.

250 Real business cards or miniature blotters, \$1.00. Letterheads, envelopes, etc., at special prices. Acorn Printery, Newport, Ky.

FOLDERS—3 1/2 x 6, \$4.00 thousand; circulars, \$2.00. Andrews, Box 1051, Fargo, N. Dak.

GUMMED Labels that satisfy, with name, business and address, 500—40c; 1,000—60c; 2,000—\$1.00; prepaid. P. Wetzel, Valhalla, N. Y.

MULTIGRAPH typewriting business correspondence, two dollars thousand. Hammermill Bond Letterheads, four dollars. Miscellaneous printing. Mayera Corporation, Monmouth, Illinois.

EMBOSS your Stationery with Hand Embosser. Circular free. Midwest, Box 47, Springfield, Ill.

COMMERCIAL Printing. Prices Right. Samples Free. The Fox Press, Frankfurt, N. Y.

DISTINCTIVE—Artistic Business Stationery that Creates Confidence. 1,000 Letterheads or Envelopes \$3.00. Samples. Moulton Printing Company, 1410-P East 8th, Kansas City, Mo.

WE print Stationery, Booklets, Catalogs, Circulars. Samples. Commercial Press, Batavia, Ohio.

QUALITY Printing! Reasonable Prices! Send for Free Standardized samples and prices. Folders. Circulars. Catalogs our specialty. Ernest Fantus, 525 South Dearborn, Chicago.

PRINTING, OUTFITS AND SUPPLIES

PRE-USED printing presses, type, materials. Lists 2c stamp. Popular Bargains, Richland, Pa.

PRINTING Presses, type, supplies. List 2c stamp. Bargains. Geo. Foster, 4342 North Robey, Chicago.

PRINT your own cards, stationery, circulars, paper, etc. Complete outfits, \$8.85; Job presses, \$11, \$29; rotary, \$149. Print for others, big profit. All easy, rules sent. Write for catalog presses, type, paper, etc. Kelsey Company, F-11, Meriden, Conn.

PRINTING Outfits—Presses, type supplies, type novelties. Send stamp for catalogue. Model Press, York, Penna.

PRESSES, Paper, type, ink. C. L. Whitfield, Ballentine, Norfolk, Va.

DUPLICATORS AND DEVICES

YOU can make 50 to 100 copies of a letter, notice, etc., at a cost of three cents on a Hoyer Quality Duplicator. Write for free trial offer. The Hoyer Duplicator Co., 14 S. Wells St., Chicago, Ill.

LETTER "Stencil-Duplicator" complete \$10. Perfect copies. F. Gerwin, Dale, Okla.

RUBBER STAMPS

RUBBER Stamp 25c—name, address; three lines, 35c. Newman Bros. & Sons, Auburn, Nebr.

ADDING MACHINES

NEW \$3.50 Automatic Adding Machine. Adds, subtracts, multiplies absolutely accurate. Capacity \$999,999.99. Fully guaranteed. 75,000 pleased users. Makes adding easy, positive, quick. Eliminates mistakes. Saves time. Postpaid \$3.50. Bassett Co., 1458 E. Hollywood Ave., Chicago.

FREE trial. Marvelous Calculator, Adds, Subtracts, Multiplies, Divides automatically. Work equals \$300.00 machines. Five year guarantee. Price only \$15.00. Write today for free trial offer. Special: \$3.00 Pocket Calculator, only \$2.00 cash. Lightning Calculator Co., Dept. E, Grand Rapids, Mich.

FOR SMOKERS

TOBACCO Postpaid; guaranteed Best Mellow, Juicy red leaf chewing, 5 lbs. \$1.40; 10, \$2.50. Best smoking 20c lb. Mark Hamlin, Sharon, Tenn.

CIGARS, hand-made wonderful flavor, 30c retail quality. 19 in can, postpaid only \$1. (or C. O. D.). Order today. Hoffbauer Bros., 580 52nd St., Brooklyn, N. Y.

BUY your cigars direct. 50 aspirations prepaid \$1.50. Agents wanted. Havana Smokehouse, Homeland, Ga.

HOMESPUN Tobacco—Mellow, sweet, aged in bulk. Smoking, 15 lbs., \$1.50; chewing, 15 lbs., \$2.25. Satisfaction guaranteed. Pay when received. Farmers Union, Mayfield, Ky.

GUARANTEED Homespun Tobacco—Chewing, 5 lbs., \$1.00; 10, \$1.75. Smoking, 10 lbs., \$1.50. Pipe free! Pay when received. United Farmers, Bardwell, Ky.

HOMESPUN Tobacco—Write for free samples and special prices. Trout & Son, Dept. N. Hickory, Ky.

FOR THE HOME

GRANDFATHER'S Clock Works. \$5.00. Build your own case; Instructions free; make good profits selling your friends. Clock works with chimes for old or new cases. Write for full particulars. Clock Co., Ruffner St., Philadelphia.

CEDAR chests only \$11.65—"Red-I-Kut" complete with rich copper trim—you assemble and save half—send for pictures. Kuempel Furniture Company, Guttenberg, Iowa.

BOATS AND LAUNCHES

BUILD your own boat for this season's use: using Brooks Knock-Down parts or patterns. 55 Models, 9' to 40'; send 25c for complete catalog. Brooks Boat Co., Inc., Rust Ave., Saginaw West Side, Mich.

REVERSE gears, propellers, pumps, and other equipment, bought, sold, exchanged. Wm. H. Baker, Pond St., Quincy, Mass.

BOAT Building Plans for amateurs. Rowing, sailing, speed, cruising. Free catalog. Rudder Publishing Company, 9 Murray Street, New York.

BOATMEN: Consider the reliable Ford engine for your boat. Send for our circular describing conversion parts. Standard Manufacturing Co., 230 Hawley St., Rochester, N. Y.

CUSHMAN Three horsepower engine, good condition, \$18.00. Carroll Wright, Hamburg, Iowa.

HUBBELL Marine Coolers convert Ford engines into marine motors. Booklet free. Ford speedboat, easily built, blueprint and directions, sixty cents. C. C. Hubbell, 14B Cottage St., East Norwalk, Conn.

WATCH REPAIRING

ALL makes of Watches repaired by experts. Write International Watch Service, Box 5P, Fordham Station, New York.

DIAMONDS, WATCHES AND JEWELRY

JOB Lot watches at a great bargain. R. Jaegermann, 5815 Easton Ave., St. Louis, Mo.

ANTIQUES, WAR RELICS AND INDIAN GOODS

RELICS, photos, medals, etc., from Europe's battlefields. Illustrated catalog 25c. International, 1889 Albany Ave., Brooklyn, N. Y.

WANTED—Antique Dickory Dickory Dock clock. W. D. Becker, 55 West Main St., Cobleskill, N. Y.

100 GENUINE Indian arrowheads from Arkansas \$4.00 postpaid. H. Daniel, Lamar, Ark.

INDIAN Relics—24 page catalog for stamp. Grutzmacher, Mukwonago, Wis.

SEND 5c for fine new list Indian relics, antique firearms. F. E. Ellis, Webster Groves, Mo.

PHONOGRAPHS AND RECORDS

BUILD your own phonograph. We furnish everything. Catalog sent free. American Phonograph Co., 4116 West 24th Place, Chicago.

MUSIC AND MUSICAL INSTRUMENTS

SONG Writers. Radio created a demand for songs. I write music. Get my circular. Hanson, P. O. Box 4218, Tacoma, Washington, D. C.

A NEW kind of violin catalog. Artistic—as the unique merit of Collingwood violins demands. Artistic repairing. Write today. Drew Collingwood, 5102 Woodland Ave., Philadelphia, Pa.

PIANO Jazz: Teaches ear piano playing, Negro harmony, all styles of bass, novelty effects, etc. Circulars free. "Piano Bill," 207-A, Ossington, Toronto, Canada.

75c LATEST book of beautiful Hawaiian songs and instrumental for piano and ukulele. MacMeekin, 379 Vine, San Jose, Calif.

SONG Poem Writers—Address Ray Hibeler, D1, 2104 N. Keystone Ave., Chicago.

VIOLINS, Deep, Mellow, Soulful—on credit. Easy terms for wonderful instrument. Get details today. Gustav F. Henning, 2424 Gaylord St., Denver, Colo.

"MUSIC Composed" to words. Bauer Bros., (formerly of Sousa's Band), Oshkosh, Wis.

SONG Poem Writers Address Monarch, 1472 Broadway, Dept. 104, New York.

SONG lyrics solicited—A different proposition. Richard Broughton, Sioux Falls, S. Dak.

I BUY, Sell, Publish Songs. Chester Escher, 455 Wayne St., Jersey City, N. J.

WRITE Songs. Big money and reputation. Write for information. J. Gordon Pub. Co., 201 N. Hoyne Ave., Chicago.

I WANT Song Poems. Casper Nathan, 3544 N. Racine, Chicago.

SONG Poem Writers—Stamp brings "Song Writers' Guide." Wm. Van Beaver, B1-1239 Elm St., Green Bay, Wis.

SHARPS and Flats—Free. Very interesting. Send for it today. Harry L. Alford, 192 No. State St., Chicago, Ill.

CORNETISTS—Trombonists—Saxophonists—Clarinetists. Get "Free Pointers." Name instrument. Virtuosi School, Buffalo, N. Y.

PATENT ATTORNEYS

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

PATENTS Procured: Trade Marks Registered—A comprehensive, experienced, prompt service for the protection and development of your ideas. Preliminary advice gladly furnished without charge. Booklet of information and form for disclosing idea free on request. Richard B. Owen, 30-Owen Bldg., Washington, D. C., or 41-B Park Row, New York.

MILLIONS spent annually for ideas! Hundreds now wanted! Patent yours and profit! Write today for free book—tells how to protect yourself, how to invent, ideas wanted., how we help you sell, etc. American Industries, Inc., 500-Victor Bldg., Washington, D. C.

INVENTORS—Write for our Guide Book, "How to Get Your Patent" and Evidence of Invention Blank. Send model or sketch of your invention for our prompt examination and instructions free. Randolph & Co., Dept. 430, Washington, D. C.

PATENTS, Trade-marks, Copyrights. Reliable services by an experienced practitioner devoting personal attention to each case. Inquiries invited. References furnished. B. P. Fishburne, Patent Lawyer, 525-A McGill Bldg., Washington, D. C.

PATENTS Procured. Prompt service. Personal, careful and efficient service. Highest references. Moderate fees. Send sketch or model for actual search and advice. George P. Kimmell, Master of Patent Law, 54-G, Legal Bldg., Washington, D. C.

INVENTORS having ideas to patent: Write for Booklet explaining Co-operative Plan for handling your applications. Tells how to sell and safeguard your inventions at lowest cost. Ralph Burch, Patent Lawyer, Jenifer Bldg., Washington, D. C.

ESTABLISHED 1864. Milo D. Stevens Company. Free Booklet. Patents, Trade-Marks, Copyrights. Offices, Monachnock Block, Chicago; Barrister Building, Washington, D. C.

PATENTS, Trade-Marks, Designs. This firm has 27 years' experience and gives expert personal service at reasonable rates. We properly protect your invention. Write for free information and exact cost of procuring patent before proceeding. John B. Thomas & Co., 902 F St., N. W., Washington, D. C.

UNPATENTED Ideas Can Be Sold. I tell you how and help you make the sale. Free particulars (Copyrighted). Write W. T. Greene, 807 Jenifer Building, Washington, D. C.

RICHARD E. BABCOCK, Patent Lawyer, Washington Loan & Trust Bldg., Washington, D. C. Booklet.

PATENTS—Send for form "Evidence of Conception" to be signed and witnessed. Form, fee schedule, information free. Lancaster and Allwine, Registered Patent Attorneys in United States and Canada, 221-Ourray Bldg., Washington, D. C.

LACEY'S Patent Sense. Valuable book free. See ad page 146.

PATENTS—Write for our Guide Books and "Record of Invention Blank" before disclosing inventions. Send model or sketch of your invention for Free Inspection and Instructions. Terms reasonable. See advertisements on pages 142 and 143. Victor J. Evans & Co., 934 Ninth, Washington, D. C.

MONROE E. MILLER, Ouray Bldg., Washington, D. C., Patent Lawyer; Mechanical, Electrical Expert. Booklet and Priority Record blank gratis.

CARL MILLER, Registered Patent Attorney, McGill Building, Washington, D. C. Write for Instructions.

"INVENTOR'S ADVISOR", Patentbook, with 139 mechanical movements, illustrations, sent free. Labinere, Patent Attorney, Three Parkrow, New York.

"INVENTORS' Guide" sent free on request; this book contains illustrations of patented inventions and gives valuable information and advice for all who have original ideas or improvements. Frank Ledermann, Registered Attorney and Engineer, Woolworth Bldg., 1712, New York.

INVENTORS: Send sketch or model for advice and exact cost of patent. Ask for our Free book: "How to Obtain a Patent." Tells what every inventor should know. Established twenty-eight years. Highest references. Prompt service. Reasonable charges. Chandlee & Chandlee, 474 Seventh, Washington, D. C.

PATENTS. Booklet free. Highest references. Best results. Promptness assured. Send model or drawing for preliminary examination. Watson E. Coleman, Patent Lawyer, 724 Ninth St., Washington, D. C.

PERCY S. WEBSTER, 203 Saving and Loan Building, Stockton, California. Long established organization. Patent booklet free.

UNITED STATES and Foreign Patents and Trade Marks; Low rates; easy terms. H. Sanders, Registered Patent Attorney, 7 Rand McNally Building, Chicago.

FOR INVENTORS

PATENTS. If you have an invention which you wish to patent you can write fully and freely to Munn & Co., for advice in regard to the best way of obtaining protection. Please send sketches, or a model of your invention and a description of the device, explaining its operation. All communications are strictly confidential. Our Hand-Book on Patents is sent free on request. This explains our methods, terms, etc., in regard to Patents, Trade Marks, Foreign Patents, etc. "Scientific American" contains Patent Office Notes, Decisions of interest to inventors and particulars of recently patented inventions. Munn & Company, Solicitors of Patents, 1523 Scientific American Building, 24 W. 40th St., New York City; 524 Scientific American Bldg., Washington, D. C.; 1313 Tower Bldg., Chicago, Ill.; 666 Hobart Bldg., San Francisco, Calif.; 521 Van Nuys Bldg., Los Angeles, Calif.

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

WANTED: Specialties of electrical or mechanical nature, patented or not, that can be marketed through automotive accessory, hardware, electrical trades. If specialty meets Delta quality standard, will buy outright or manufacture on royalty basis and market it through our established channels under nationally known Delta trademark. Send full information and drawings. Delta Electric Company, Marion, Ind.

INVENTORS who have not had manufacturing experience, should get advice from the manufacturer's point of view, before spending a lot of money. We develop inventions along practical lines and manufacture by contract. Can give you references in any city in the U. S. Denning Mfg. Co., 1775-1777 East 87th St., Cleveland, Ohio.

INVENTORS—Write for our Guide Books and "Record of Invention Blank" before disclosing inventions. Send model or sketch of your inventions for our free inspection and instructions. Terms reasonable. See advertisements on pages 142 and 143. Victor J. Evans & Co., 157 Ninth, Washington, D. C.

SOMEWHERE there is a new automobile product. A firm with national distribution—ample finance—wishes to add new items to their line. A real opportunity for practical invention. All letters confidential. Address P. O. Box 39, Indianapolis.

LACEY'S Patent Sense. Valuable book free. See ad page 146.

PATENTS Procured: Trade Marks Registered—A comprehensive, experienced, prompt service for the protection and development of your ideas. Preliminary advice gladly furnished without charge. Booklet of information and form for disclosing idea free on request. Richard B. Owen, 30-Owen Bldg., Washington, D. C., or 41-R Park Row, New York.

INVENTORS Universal Educator—contains 900 mechanical movements; 50 perpetual motions. Tells how to obtain and sell patents. Suggests new ideas. Explains how to select your attorney and avoid patent sharks. Price (revised edition) \$1.00 postpaid. Albert E. Dieterich, 621-Ouray Bldg., Washington, D. C.

GET your own patents. Legal blanks, complete instructions \$1. Cutting Sons, Campbell, Calif.

SELL your patent yourself. New successful sales plan, letter and 160 real patent buyers \$2.00 postpaid; particulars free. Leroy Brown, 1311 N. Broadway, Baltimore, Md.

WILL Finance Patents of commercial value, royalty basis, manufactured for \$5.00 and under. Mail model and copy of patents or full details. Kamstone Holding Corporation, 41 East 42nd St., New York.

I SELL Patents. Established in 1900. The service of efficiency, because it is experienced. Nationally known and respected. Sent patent copy. Charles A. Scott, 773PM Garson Ave., Rochester, N. Y.

DRAFTSMAN having inventive ability wants home work. Fred Peterson, Dothan, Ala.

MARKET your own inventions. Free counsel. See advertisement under Advertising Agencies, page 49. Frank W. Lenhoff Advertising Agency, Chicago.

PATENTS Wanted by manufacturers. Send description. Box 128, Dowagiac, Mich.

LET us sell your proposition. Fred H. Beach & Co., Vincennes, Ind.

UNPATENTED Ideas Can Be Sold. I tell you how and help you make the sale. Free particulars (Copyrighted). Write W. T. Greene, 806 Jenifer Building, Washington, D. C.

I AM in touch with hundreds of moneyed men and manufacturers who wish to buy good inventions. Write Hartley, 38 Court St., Bangor, Me.

WE pay cash for patented ideas we can use in the manufacture of amusement devices. Send us your ideas. Spillman Engineering Corp., North Tonawanda, N. Y.

INVENTIONS Developed—Your crude ideas developed into practical form for your patent application. Model not necessary. Send rough sketch and description for estimate of cost and advice. 27 years' experience. Albert E. Dietrich, Engineer and Registered Patent Attorney, 621½ Ouray Building, Washington, D. C.

WANTED—Substantial articles for mail-order business. What have you to offer? Write Liberty Novelty Company, 3557 W. 22nd St., Chicago, Ill.

PATENTS FOR SALE

FOR Sale, money-making invention, patents pending. Hat cleaning and remodeling machine; it will clean, dry and remodel 150 hats in a day—men's hats only. Will sell outright or royalty basis. Mr. S. D. Franko, P. O. Box No. 74, Havre de Grace, Md.

ROYALTY Basis—Equalized pressure rotary valve. For internal combustion engine. D. J. Cloyd, 325 Prospect, El Paso, Tex.

NEW Flashlight patented, for specific purpose; also for general utility purpose; easily and cheaply made; needed in every home. Outright or royalty. Paul C. Zieschang, 1429 N. Fifth St., Columbus, Ohio.

COAL Tipple Grader, portable on railroad track, for stripping pits. Three patents, sale or royalty. Grover C. Singer, Oakland City, Ind.

OUTRIGHT—Automobile shock absorber. Easily applied to front and rear springs. Fits between spring and frame work. N. L. Dootson, % Hotel Holland, 221 Mason St., San Francisco.

OUTRIGHT or royalty. Slide suspender, garter buckle attached without sewing. Patented suspender. No sewing. Albert Leighton, 25 South St., New York City.

FOR Sale—Patent on fountain mop and duster. I have one party wants five hundred dozen per month. Lester Doak, McMinnville, Tenn.

TO MANUFACTURERS—Sale or royalty. Patent No. 1,607,933. Whitney Book Trolley, adjustable table. A. Whitney, Big Timber, Mont.

OUTRIGHT or royalty. Household device. Dies furnished. Floyd Mosbacher, 1218 Margaret St., Munhall, Pa.

RETAIL Fabric Measure. Cuts outright on dot. No waste. One-fifth competitor costs. McDermott, 74 Buckingham, Hartford, Conn.

FOR Sale—Patented drying attachment for electric washing machine. Wm. A. Wheeler, 2904 East 12th St., Kansas City, Mo.

OUTRIGHT or royalty—Safety switch for serials. Eliminates the use of lightning arresters, also designed for rural telephone work. F. E. Olson, Akeley, Minn.

MILLIONS can be made with my Patent No. 1,604,009. Steering device for autos; every Ford and Chevrolet car owner shall have one to prevent turning over and stop wobbling wheels. This device sells for \$5 and costs to manufacture 69 cents; enormous field is open to do business. Other important business needs all my attention. Outright \$12,000, terms. L. Wolf, Fig & Gilchrist, Tampa, Fla.

FOR Sale—Hanger, Butcher, Gamble singletree, neckyoke. Patent pending. E. B. Williams, Cornelia, Ga.

FOR Sale—Patent on useful invention of improved carriage runners, which can be put on wheels or taken off in ten seconds. U. S. patent will be sold for reasonable offer. Address Waldemar Suominen, 179 Belmont St., Worcester, Mass.

OUTRIGHT or royalty, recent U. S. patent No. 1,598,804; weight-operated circuit closer. Safety signals. Nathan L. Brumback, Inventor, Box 863, Eldorado, Kans.

OUTRIGHT or royalty—Steady rest attachment for engine lathes. Holds work rigid and allows tools to cut without taper. On or off at once. H. B. Scott, Windsor, Vt.

FOR Sale—Patent, Improved Flour Sifter, outright or Royalty Basis. Harry Nakagawa, Tanana, Alaska.

WHY let your patents lie idle? Tell our two million five hundred thousand readers about it! The majority of our readers are especially interested in new ideas and inventions. Ask me to tell you how other inventors successfully sold their patents. M. L. Rund, Mgr., Classified Advertising, Popular Mechanics Magazine, Chicago.

ELECTRICAL

RESISTANCE Wires, electric heating and radio. One dollar per spool. National Electric Products, 3947 Armitage Ave., Chicago.

SURVEYING INSTRUMENTS

LARGEST stock of new and used surveying instruments in the country direct from factory. Satisfaction guaranteed or money refunded. Wissler, 619 N. Broadway, St. Louis, Mo.

MODELS AND MODEL SUPPLIES

INVENTORS—We make models, dies, manufacture your invention, help you perfect it. Free information. Strand Mfg. Co., 644 W. Randolph St., Chicago.

LET our experience be your guide. Models that are models; tools and equipment for economic manufg. Patterns of all types; manufacturing in all branches. Satisfaction guaranteed. United Machinery Company, Cincinnati, U. S. A.

SHIP Model supplies and fittings. Send dime for list. Roy Hancock, 323 Douglas Ave., Portsmouth, Va.

MODEL steam engines and boilers. Boat and boiler fittings. Send 10¢ stamp for catalog. Refunded with first order. Model Machine Shop, P. O. Box 5, Station Y, New York City.

WORKING models built. Drawings prepared free. Let our designing and engineering departments and 27 years' experience assist you with your invention. Lowest prices. Hohmeier Mfg. Co., 1385 E. 17th St., Cleveland, Ohio.

PATENTS. Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instruction or write for free book "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, Security Bank Building (directly across street from Patent Office), Washington, D. C. See pages 140 and 141.

THE Modelmaker, a magazine for all interested in making working models, boats, etc. Sample 10¢. Modelmaker, 122 Liberty St., New York.

WOOD'S for Models, Scroll Work and inlaying. George Wild, 510 East 11th St., New York.

SPECIAL machine builders, tool and die makers, inventor's models, production work of all kinds. Dept. L. Quality Hardware & Machine Co., Ravenswood and Thorndale Avenues, Chicago, Ill.

WE make working models for inventors and do experimental work and carry a complete stock of brass gears and model supplies. Send for catalogue. The Pierce Model Works, Tinley Park, Ill.

MODELS, Experimental Work, Light Manufacturing, and Stamping. Frostholt Bros., Syracuse, N. Y.

WELDING AND SOLDERING

ACETYLENE Brazing and soldering torches, \$2.00; light welding and lead burning torches, \$7.00. Postage prepaid upon receipt of price. Marshall Mfg. Co., Kansas City, Mo.

MANUFACTURING

MODELS, Dies, Manufacturing Ideas developed, screw machine products, metal stampings, and contract manufacturing of metal parts. Schroer Manufacturing Co., 2104 Campbell St., Kansas City, Mo.

INVENTOR'S Models, Machine work. Light Stampings. Nortwed Model Machine Shop, Ethan, S. D.

PATTERNS, wood and metal. Models, tools and dies. Brass, bronze, aluminum and iron castings. Screw machine work, production work of all kinds. Write Modern Machine & Pattern Co., Terre Haute, Ind.

WE help you design, make your models, dies, manufacture your products. Standard Die & Specialty Co., 1932 Austin Ave., Chicago.

SPECIAL Machinery or parts, dies, tools, metal specialties, models, stampings, stock gears and model supplies. Send for Catalogue. The Pierce Model Works, Tinley Park, Ill.

MANUFACTURING Models, Dies, Stampings, Brass Work, one or thousands. Baum's Metal Specialties, Kansas City, Mo.

WIRE goods made to order. Cooley Mfg. Co., 530 N. Western Ave., Chicago.

DIES, Jigs and Stamping. Acme Tool Co., Mason City, Iowa.

WE design and build special machinery, make models, dies, stamping tools, do general machine work and light manufacturing. Marshall Mfg. Co., Kansas City, Mo.

MACHINERY, TOOLS AND SUPPLIES

10-IN. POWER Bench Drills, complete with chucks, brand new. Price \$25.00 each. Send for circular. Many other bargains. Botwinik Brothers, Inc., 67 Water St., New Haven, Conn.

WATCHMAKERS' Lathe at a bargain. R. Jaegermann, 5815 Easton Ave., St. Louis, Mo.

PATENTED Steel Frame, pulley and governor, for using Ford motor for belt work. Satisfaction guaranteed. Write for bulletin. Dunlap Fordpower Co., Wichita, Kans.

PIPE second hand, guaranteed suitable for all practical purposes with new threads and couplings, sixteen feet and over; cut to your requirements, also Boiler Tubes, New Fittings. Pfaff & Kendall, 102 Waydell St., Newark, N. J.

CUTTERS, Reamers, Mandrels, Counterbores, etc. Brand new at one-half market price. Send us your requirements. Cincinnati Automatic Machine Co., Cincinnati, Ohio.

CONCRETE Building Block Machines and Molds. Catalogue free. Concrete Machine Co., 5 N. Main St., St. Louis, Mo.

OTHERS have successfully sold their machinery through our columns—so can you. Ask me for proof. M. L. Rund, Manager, Classified Advertising, Popular Mechanics Magazine, Chicago.

ENGINES, MOTORS AND DYNAMOS

BARGAINS—Motors, machinery, $\frac{1}{4}$ h.p., \$6.00; $\frac{1}{2}$ h.p., \$18.75; 1 h.p., \$25.00; electric drills, \$14.95. 100 other bargains. Send for "Bargain Sheet No. 630." Acme Tool Co., 627 Washington St., Chicago.

ALTERNATING and direct current motor bargains. All sizes, all kinds, new and rebuilt. Wholesale price list free. Guaranteed makes only. Motors bought, repaired, exchanged. Special fan prices. Hyre Electric Co., 615 HZ So. Dearborn St., Chicago.

ANOTHER lot new 110 v. alternating current washing machine motors, \$5.50 each; three, \$5.25 each; six, \$5.00 each; 1-12 horse 110 v. universal, \$2.75 each. Single motor cash with order, quantity \$5.00 cash, balance on delivery. Also other bargains. Queen City Electric Co., 1736 Grand Ave., Chicago, Ill.

GUARANTEED A. C. 110 v. 60 cy., 1-6 and $\frac{1}{8}$ h.p., \$4.50 and \$5.00. D. C. 220 v. $\frac{1}{4}$ h.p., \$6.00. 25% required, balance C. O. D. Elie & Co., 1018 Lake, Chicago.

GOVERNORS for all auto engines where used for power plants. Send for circulars. A. C-S Governor Co., Springfield, N. Y., or 215 W. Manchester, Los Angeles.

WRITE for bargain catalogs on electric motors, generators, electric drills, etc. Do not buy, consult us first. General Distributing Co., Security Bldg., Duluth, Minn.

MOTORS—New GE 110 or 220 volt 60 cycle Single Phase $\frac{1}{4}$ HP, \$11.90; $\frac{1}{2}$ HP, \$28.53; 1 HP, \$38.50. Mail \$3 check or money order. We will ship COD anywhere. Motor Specialties Co., Crafton, Penna.

STEAM Engines—one H. P. \$18.00; $\frac{1}{2}$, \$12.00. James Chambliss, Bessemer, Ala.

BLACKSMITHS

BE a Master Mechanic Blacksmith and Expert Tool Maker and Dresser with colored tempering charts. Price \$1.00. Valuable samples free. W. M. Toy, Sidney, Ohio.

BENDING MACHINES

THE Famous Hossfeld "Wrenchless" Universal Iron Bender is the last word in bending machines; bends both Pipe and Bars to most any conceivable shape. Bends Eyes, "U"s, Angles, Rings, Colls, etc. Accurately bends anything from a small nail up to a 1 $\frac{1}{2}$ -in. pipe cold. Instantly adjusted without a wrench. Thousands in use. Write for descriptive circular and prices. Hossfeld Mfg. Co., Box 344, Winona, Minn.

FOR SALE—MISCELLANEOUS

HAIR Grows when our Vacuum Cap is used a few minutes daily. 60 days' free trial. No drugs or electricity. 20 years success. Stops falling hair and dandruff. Booklet free. Modern Vacuum Cap Co., 555 Quincy, Denver, Colo.

ADDRESSOGRAPHS. Letter Folders. Multigraphs. Envelope Sealers. Duplicators. Less than half price. Guaranteed. Pruitt Co., 117 No. Market, Chicago.

WANTED—MISCELLANEOUS

CASH Paid for dental gold, false teeth, discarded jewelry, diamonds, platinum. Mail to Robert Uhler, 425 Sterling St., Brooklyn, N. Y. We repair jewelry like new.

MAIL us your discarded Jewelry, Gold, Crowns and Bridges, Watches, Diamonds, Silver, Platinum and old False Teeth. Money promptly mailed. Goods returned if offer refused. United States Smelting Works (The Old Reliable), Dept. 71, Chicago.

HONEY

DELICIOUS Alfalfa clover honey, one, 10-lb. pail, \$1.75 postpaid, 4 zones. Arthur Erickson, St. Hilaire, Minn.

REAL ESTATE, FARM AND ORCHARD LANDS

LAND Free if planted to bananas. Bananas bear a full crop the second year. \$5.00 monthly will plant five acres, which should pay \$1,500 profit annually. Reliable companies will cultivate and market your bananas for one-third. Bananas ripen every day and you get your check every 90 days. For particulars address Jantha Plantation Co., Empire Bldg., Block 726, Pittsburgh, Pa.

POULTRY Land \$5 down \$5 month buys 40 acres southern Mo. Price \$200. Send for list. Box 22-N, Kirkwood, Mo.

ATTENTION—"Get acquainted." Cash for your property. Farm, Hotel or Retail Store, no matter where located; confidential service. Hayes' Business Agency, Cincinnati, Ohio.

STROUT'S Farm Catalog. Lowest-in-the-country prices. Many unusual opportunities. F. V. Cutler bought a cheap farm, several years ago, invested \$500; in 1926 he sold \$5000 worth certified seed potatoes from 6 $\frac{1}{2}$ acres, has a large dairy and is on "Easy Street." Your free catalog is stamped and ready to mail. Just send your name—today. Strout Agency, 255-P, 4th Ave., New York City.

OZARKS—10 acres near White River and proposed power dam, \$100, \$5 monthly. Alvin Zimmerman, 1802 N. 5th, Kansas City, Kans.

SELL your property quickly for cash, no matter where located. Don't pay big commission. Particulars free. Real Estate Salesmen Co., Desk B, Lincoln, Nebr.

PECAN—Orange-fig Groves "On the Gulf" Monthly payments. Guaranteed care. Big, quick returns. Suburban Orchards, Dent, M. Biloxi, Miss.

SEEDS, PLANTS AND TREES

STRAWBERRY Plants—Excelsior, Improved Klondike, Missionary, Dunlap, 500, \$2.00; 1000, \$3.25; 5000, \$15.00; 10,000, \$27.50, express collect. We have best list of leading varieties. Onion plants, White Bermuda, Red Bermuda, Yellow Bermuda, 500, \$1.00; 1000, \$1.75; 5000, \$8.50; 10,000, \$16.00. Frost Proof Cabbage plants, leading varieties, 500, \$1.25; 1000, \$2.00; 5000, \$9.00; 10,000, \$17.50. All onion and cabbage plants postpaid. All plants packed in damp moss assuring safe delivery. Asparagus roots, rhubarb and horseradish, sweet potato plants and seed stock. Price list in color free. Send today for copy. J. A. Bauer, Judsonia, Ark.

GLADIOLI, Rainbow collection. 10 large bulk 25c postpaid. We carry 172 large flowering varieties. Free catalog. Harrison Paige, Mendota, Ill.

CABBAGE, Onion and Tomato plants, \$1 1000. Clark Plant Co., Thomasville, Ga.

POULTRY

NEW Profitable fowl, cross of turkey and chicken; eggs, stock and chicks for sale. A. B. Schultz, Sumner, Iowa.

NO. 2 Half-Price Chicks. We have cut our prices almost in two. All kinds. Quick shipment. Three-color catalog free. Missouri State Hatchery, Box 711, Butler, Mo.

HOLLYWOOD-TANCRED 300-336 Egg blood leghorns, hatching eggs, chicks, pullets, prompt shipment. Satisfaction guaranteed. Catalog, R. E. Sandy, Box, B. Stuarts Draft, Va.

RABBITS

MAKE Big profits with Chinchilla rabbits. Real money makers. Write for facts. Conrad's, 852, California Bldg., Denver, Colo.

ROOTS AND HERBS

WONDERFUL 96-page health guide, 10c. Contains over 250 valuable recipes for making herb medicines. Worth dollars! Shawnee, 145 West 112th St., Chicago.

HERB Doctor Book—10 cents. 250 receipts for making herb medicine. Hazzard Company, Box 1, Vanderveer Park, Brooklyn, N. Y.

DOGS AND PETS

FLYING Squirrels—Rarest, handsomest pets for house or park. Unequaled show-window attractions. Fun to raise them. Mated pair and booklet \$3.00; safe delivery guaranteed. Wildwoods Fur Farm, Woodville, Tex.

RUSSIAN Wolfhounds, registered. Kanyon Kennels, W. S. Friedrich, Arbon, Idaho.

PERSONAL

TAKE up Visualism and Cultivate your Memory. 6 simple courses give extraordinary results. 12 courses make you a Genius. 1st Course \$1. 6 Courses \$5. 12 Courses \$9 only. Newall, Church Institute, Stornoway, Scotland.

PERMANENT Spiritual evidence. A new study. Free literature. R. C. Hill, 602 W. Jefferson Ave., Detroit, Mich.

STOP Fingernail biting habit. Copyrighted recipe \$1.00 guaranteed cure or money refunded. No trick dope or chemicals. M. W. McIntyre, Wilmington, N. C.

ALL Foot Ailments treated at home. Write Eatons Foot Specialties, Bandon, Ore.

FORTUNE-TELLING by cards (plain instructions), mystic secrets, etc.—all 10c. G. Elsea, Bowling Green, Ohio.

VALUABLE Hints for success. Quarter brings booklet of explanatory information you've sought, prepaid. Send now. Box 56, Sidney, Iowa.

MEMORY improved a thousand per cent. Students, teachers, clergymen, orators, actors, all need this system. If you wish to be successful, you must have a good memory. Information free. Write to Dr. M. Kestner, 228 Hillside Ave., Newark, N. J.

DANCING—Full instructions. 50c. G. Stewart, 3446 N. 3rd St., Philadelphia, Pa.

CARTOON of yourself from photo, by newspaper artist. Suitable for cut. \$1.00 cash. Castle Studios, Independence, Mo.

FREE: Valuable book telling the uses of roots and herbs. Box 29, Station L, New York.

TOBACCO or Snuff Habit Cured or no pay. \$1.50 if cured. Remedy sent on trial. Superba Co., N3, Baltimore, Md.

WONDERFUL health book for only 10c (publisher's price \$1.00). Appreciated by every reader, sick or well. Teaches health the natural way, also suggest reliable self treatment of disease. Address, Author, Box 437, Seattle, Wash.

SEND 25c coin and your date of birth for forecast of your vibrations for 1927. Aryel Synclare, Numerologist, Box 25, Patton, Calif.

MISCELLANEOUS

LOCKSMITHS—Something new. Write. Also buy, sell and exchange codes. Free list. Locksmith, 1656 Lawrence, Denver, Colo.

CASH in on your Artistic Ability. Your home, your office, your spare time, your gold mine. Not a correspondence course. Sample and particulars 10c. Straco, 1013 Mulberry, Springfield, Ohio.

A PENCIL portrait of your photo. Send clear photo and \$1.10. A. Seemann, 2104 Liberty Ave., Terre Haute, Ind.

CASH paid for butterflies, insects. See Sinclair Display Advertisement on page 22.

MEXICAN-MADE pistol holsters, cartridge belts, lariats; hand-carved belts and holsters; horse-hair belts, hat bands, fobs; rattlesnake belts, fobs. Tex-Mex Leather Co., 309 Esperson Bldg., Houston, Tex.

GUARANTEED Anti-backlash attachment for any reel. \$1.50. Circulars. Bait Co., Windfall, Ind.

TATTOOING Supplies from a master of art. Send 10c for price list and sample of my designs. "Bielman," 752 N. Dearborn, Chicago.

MIRRORS Resilvered at home. Costs less 5 cents per square foot, you charge 75 cents. Immense profits plating autoparts, reflectors, tableware, stoves, refinishing metalware, etc. Outfits furnished. Details free. Write Sprinkle, Plater, 288, Marion, Ind.

WEEDS—Cut them with cutter bar on Shaw Garden Tractor. Also plows, cultivates and runs belt machinery. Low prices. Immediate delivery. Shaw Manufacturing Company, Department C, Galesburg, Kans.

CUTS anybody can make. Simple, cheap process. \$1. Specimens, particulars. 2c stamp. M. Day, Windfall, Ind.

HOMEOPATHIC and Biochemic preparations sent postpaid to all parts of the world. Manual and booklets free. Halsey Bros. Co., 645 St. Clair St., Chicago, Ill. Established 1855.

ARTIFICIAL Eyes. Booklet free. Denver Optic, 559 Quincy, Denver, Colo.

TATTOOING Supplies Direct from Manufacturer. "Waters," 965 Putnam, Detroit.

ARTIFICIAL eyes fitted by mail, \$5. Free booklet explains. Ramsdell Optical Company, Moline, Ill.

TATTOOING—Learn how with my outfits. Descriptive circulars sent anywhere. Sergt. Bonzey, 367 South Main, Providence, R. I.

AMATEUR Cartoonists: Make money in spare time with new cartoon selling plan. Illustrated chart, complete instructions, \$1. Smith's Service, Wenatchee, Wash.

MINERAL Wealth. Specimens: Gold, silver, copper, lead, zinc ores, 10c each. Mineral specimens. Buskett, Joplin, Mo.

TELL an army of 3,000,000 live readers all about your offer! If you have anything to sell, buy or exchange, or if you have any reasonable proposition, tell our readers all about it—they'll respond quickly. Our booklet "How to Create More Business" contains some very interesting, helpful facts. Write today for your copy—it's free. M. L. Rand, Manager Classified Advertising, Popular Mechanics Magazine, 200 E. Ontario St., Chicago, Ill.



Don't Let Anybody BULLY YOU

Learn Scientific Tricks
of Physical Mastery

By a few simple tricks you can have any assailant at your mercy quick as a flash. The astounding secrets of self-defense, used by the New York Police, are revealed in the marvelous, officially recognized system—

Captain Wallander's Course

All Complete In

Physical Training Manual

By Capt. A. W. Wallander

Commander Physical Training, New York Police

A complete course in physical culture. Scores of gripping action photos showing just how to throw a bigger man and overpower him—disarm a hold-up thug—build up muscle—keep in fighting trim. Hundreds of health hints, too; care of the feet, prevention of colds, correct posture, walk without fatigue. This is the genuine book used by the New York Police, now available TO YOU.

Easy to Learn Let Capt. Wallander give you his great secrets and detective tricks. You'll hardly believe that such valuable knowledge could be learned so easily.

ALL YOURS IN WORLD'S MOST AMAZING COURSE

In Physical Culture and Police circles this volume is world famous. Send immediately for your copy. **DON'T SEND MONEY NOW.** Send coupon today. When volume arrives, pay the postman \$1.97, plus few cents postage. If you are not satisfied return volume and get money back. **\$1.97**

SIEBEL PRESS, 34-G W. 20th St., New York.

Send me Capt. Wallander's Physical Mastery Course as contained in the "Physical Training Manual."

Name.....

Address.....

City..... State.....

(\$2.25 U. S. Cash with order outside the U. S. A.)

How to Work Wonders With Your SUBCONSCIOUS MIND



David V. Bush

Give me just 60 minutes and I'll unlock the floodgates of that vast reservoir of mental power—your Subconscious Mind. Note the immediate effect on your business, social and everyday life.

By DAVID V. BUSH

A vast reservoir of mental energy! A huge storehouse of brain power! That's the Subconscious Mind. You've got it. Your friends have it. Everyone has it. But not one in a thousand knows how to use it.

In 60 minutes I can show you exactly how to awaken your Subconscious Mind—how to harness it—how to make it work for you—how to make it solve problems—how to make it remember things—how to use its vast creative powers to boost your success and double your money-making ability.

In my new 140-page book, "The Subconscious Mind," I tell just what the Subconscious Mind is—just how to reach it—just how to control it—just how to get the most out of it. It's simple as A. B. C.

ONLY 50 CENTS

Write today for this amazing book, "The Subconscious Mind." Send only 50 cents in full payment. If you are not delighted, return the book within 5 days and your money will be instantly refunded.

David V. Bush, Publisher, 225 N. Michigan Blvd. Dept. T-1055, Chicago, Ill.



Learn SIGN AND SHO-CARD Lettering

Fascinating work. Pays \$50 to \$200 weekly. Vassos gets \$25 for a sho-card. Some posters bring \$300. Many earn while learning. Study in spare time. Learn quickly. For facts and guarantee write: DETROIT SCHOOL OF LETTERING, 173 Stinson, Detroit, Michigan.

"Big-pay jobs are easy to get if you're a National-trained ELECTRICAL MAN!"

YOU can save yourself from years of hard, disagreeable work at poor pay—insure your success—and start earning big money several years sooner if you get into the fast-growing Electrical industry, with the right training.

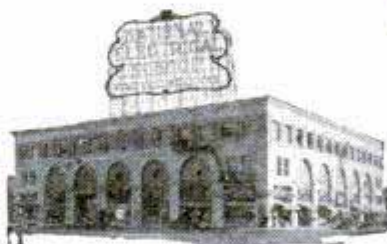
Electrical employers want experienced men—not apprentices. They demand that you know your stuff if you want real money. You get practical experience in months instead of years at National Electrical School. Quality training on a half million dollars worth of new electrical equipment—under expert instructors—gives you experience an apprentice never gets. No wonder employers pay more to National-trained men. Send for

BIG FREE ELECTRICAL BOOK

Learn how to get into Electricity's best paid positions. Read about National's Free Employment Service. Mail Coupon!

**NATIONAL ELECTRICAL
SCHOOL -:- Los Angeles, California.**

—says George S. Heilig, 1200 Larrabee St., Sherman, Cal.
"I have recommendations from all my employers and they all want me to come back," he writes. "I have been offered lots of jobs, unquestionably because of the training I got at National."



National Electrical School, Dept. 506
4006 Figueroa St., Los Angeles, Calif.

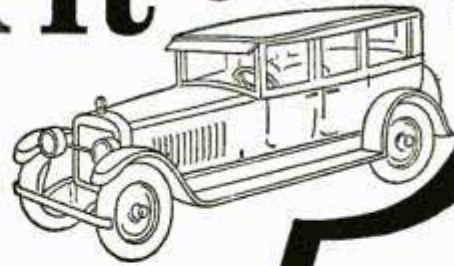
I want a well-paid Electrical Job. Send free book that tells me how to get it.

Name.....

Address.....

City..... State.....

Can you fix it?



New books have "jiffy index," making all facts instantly available. You find anything you want to know in a moment, in this brand new 1927 edition.

These books tell how

HERE are the most interesting, the most practical books we have ever published on automobile construction, operation and repairs. Brimful of facts, photographs and explanations so easy to understand that anyone can learn how in almost no time.

Over 2000 pages, with diagrams, blueprints and everything else needed to make anyone an authority on automobiles.

Whether you want to qualify as garage owner, auto repair expert or merely wish to know how to keep your own car 100% efficient, you will welcome these books, especially on our

No Money Offer

This plan brings this valuable information within the reach of everyone. You don't send us a single penny. You don't have to pay us anything—just send your name and address and we'll send you the complete set of 5 volumes, specially bound in Flexo covers.

Read them carefully; keep them 10 days; find out anything you want to know, and then if you want to keep them, send only \$2.00 then and \$3.00 per month until the special low price of \$24.80 is paid. There's no further obligation.

American Technical Society Membership Given

This is a great organization for the publishing and spreading of specialized knowledge—we have over a million dollars of resources, enabling us to get the cooperation of the largest automobile manufacturers and dealers, who have furnished us plans and photographs. If you send NOW for this new edition of Automobile Engineering, we will include a Consultation Membership in this great organization.

Eighteen automobile experts will be ready to help you at all times. You can write or wire any time for special information. Answers will be sent to you promptly—without cost.

EMPLOYMENT SERVICE FREE

In addition to all this, those who send now will be entitled to the services of our EMPLOYMENT DEPARTMENT without charge. We are in daily contact with firms all over the country who need good men and are willing to pay big. This service costs you nothing. Don't miss this special offer. Send now.

Don't Hesitate

There are no strings to this offer—it means just what it says. Send name and address on the coupon and ALL of the five books—the complete set—will be sent to you for examination.

Remember one fact only which you can find in these books may save you an expensive repair or help you to a better job.

Learn All About Autos

Get these five big books on this liberal offer and learn all the things you want to know about autos.

Carburetors, engines, springs and spring suspension, brakes, 4-wheel drives, lubrication systems—all are fully covered.

These complete and comprehensive auto books are yours if you want them on this easy plan. Send for a set NOW; there's nothing to pay.



You don't have to read the books through; the index enables you to put your finger on the information wanted in a jiffy.

For Free Offer, Use Coupon

American Technical Society,
Spec. Dept. A-519, Chicago, Ill.
I would like to look at the 5 Auto Books described above. Send them on your FREE offer. I will examine them carefully and return them in 10 days unless I like them; in which case I will send you \$2.00 then and \$3.00 per month until the total price of only \$24.80 is paid. You are to also send me Consulting Membership Certificate in the American Technical Society and I am entitled to the services of your employment department without charge.

Name.....

Street.....

City.....State.....

Reference.....

Hawaiian Guitar

GIVEN

When You Enroll

This Hawaiian Guitar expert and professor wants the opportunity to welcome you as a student so you will quickly learn how to play a Hawaiian Guitar—yes, you will be able to play just like the native Hawaiians. To get you started and help your musical success, which will bring you popularity, you will receive a beautiful Hawaiian Guitar, the same as the one pictured, when you enroll. Our short cut method of instruction will enable you to play a piece almost from the first lesson. Rush coupon for full particulars today and we will reserve a Hawaiian Guitar for you.

Worth
\$18



Play Quickly

With our short cut method of instruction you will quickly learn how to play Hawaiian Guitar, which will bring you popularity and social success. You learn to play from notes. If you never had any musical training, you will quickly get on, because our nine experts have perfected a course of home instruction which is as simple as learning A, B, C's.

Picture and Phonograph Record Method Easy

We don't depend upon printed lessons only for your success, but we also furnish pictures of our professors playing, diagrams, charts and phonograph records for each lesson. This practically brings our professors from our studio to your own home and enables you to listen to their playing just as if they were actually in front of you. To prove this is easy, we will send you your first lesson free. Rush coupon now.

HAWAIIAN STUDIO No. 5205
of New York Academy of Music
100 Fifth Avenue, New York, N. Y.

Please rush your Free book, "How to Learn Hawaiian Guitar," and my first free lesson. Also reserve a Hawaiian Guitar for me. This obligates me in no way whatever.

Name.....
Address.....
City..... State.....

Why Good Dancers Are Popular

EVERYONE admires and wants to dance with the person who knows the latest steps. There is no need of being a wallflower! By my remarkable new easy method anyone can learn the newest dances at home in a few hours. Much less expensive than from a personal teacher. No music or partner needed. So simple even a child can learn quickly. **Almost one half million have learned dancing by mail.** Your own success is guaranteed.



Posed by
Edna
Murphy
and
Arthur
Murray

To prove I can quickly and easily make you an accomplished dancer, I will send you **FREE** my 32 page book and **TEST LESSON**. To pay the cost of mailing, handling, etc., send 10c. Learn in private—surprise your friends. Act now and be a good dancer soon!
ARTHUR MURRAY, Studio 714, 7 East 43rd St., NEW YORK



MAKE \$75 a WEEK!

Paint and Duco Autos

20,000 cars need refinishing every year or two. Learn to refinish with Duco, paint, lacquer at amazing profit. Our expert teaches you quickly at home, in spare time. Easy course. Material and equipment included without extra cost. Write today for full details.

American Auto Painting School, Dept. 201, 427 S. Ashland Ave., Chicago, Ill.

Free! Learn How to Raise More Chickens, Get More Eggs and Save Feed. Prof. Quisenberry's new 1927 Free Book Now Ready Shows how to raise more chickens—less losses. Money making poultry secrets. Quisenberry's NEW WAY made many poultrymen rich. Send name, address and kind of poultry you like.
American Poultry School, Dept. 70 K. C. Mo.

Test Your Art Ability FREE

If you like to draw, test your natural sense of design, proportion, color, perspective, etc., with our Art Ability Questionnaire. Learn if your talent is worth developing, and how much training you will need. You will be frankly told what your score is.

Many Federal Students are making \$3,500, \$4,000, \$5,000 and \$6,000 yearly. The Federal course is recognized everywhere by art employers and buyers of commercial art. Learn at home in spare time, without previous training. *Personal, individual criticisms on your work.* Get this free test—send now for your Questionnaire.

Federal School of Commercial Designing
627 Federal Schools Bldg. Minneapolis, Minn.
Send me your free Questionnaire.

Name.....
Address.....



Test This Amazing Money Making Invention **FREE**



Men, here's the most remarkable money maker of the age! A little automatic machine that makes old-style can-openers obsolete! Now, just a twist of the wrist makes the dollars hum for you! So mail the coupon today for liberal **FREE TEST OFFER**.

\$7 to \$10 In An Hour Just Showing This \$1,000,000 Can Opening Machine

NO more awkward stabbing and hacking with old-style can openers! No more danger of blood poisoning from gashed and lacerated fingers! For now a remarkable new invention banishes every old-style can opener to the scrap heap. Now a simple twist of the wrist opens any can in a couple of seconds. No wonder they all simply go wild over it! No wonder salesmen often sell to every house in the block and make from \$7 to \$10 in an hour!

Works Like a Charm

This queer little device doesn't just chop a ragged hole in the top of the can. It cuts the entire top completely out, clean as a whistle! The machine takes hold of the can—opens it—flips up the lid so you can grab it—and gives it back without any sharp edges to snag your fingers. You just put the can in the machine—turn the handle—and almost instantly the job is done!

Sells Itself in 10 Seconds

Everyone knows how women detest the dangerous old-style can opener. Imagine,

then, how they welcome this startling new method—this **automatic** way of doing their most distasteful kitchen task. Men, honestly I'm not exaggerating one bit when I tell you that not ten words are necessary to sell any of them! All you do is hand your demonstrator to your prospect and let her try it! She sells herself in ten seconds by the clock—and you pocket a nice, fat profit! Yes really, it's just that simple and easy! That's why \$75 to \$150 a week is easy anywhere.

Opens Any Can in a Jiffy



You just fasten the can in the holder and turn the handle. Nothing complicated, nothing to get out of order. Opens any can, square, round or oval, in a few seconds. And, men, **IT'S PATENTED**, so there is no competition.

Act Quick for Free Trial Offer

I don't care whether you're an "old timer" or just breaking in, the quickest, easiest money of your life is waiting for you now, right here! That's a mighty strong statement. But all I ask is a chance to prove it at my risk. I know this proposition will coin money for you so fast that it will make your head swim! Territories are closing fast. The Free Test costs you nothing. Just mail me the coupon and I'll shoot you the most sensational dollar making plan you ever heard of. Mail it today! Right now!

Central States Mfg. Co.

Dept. E-700
4500 Mary Ave., St. Louis, Mo.

OH BOY! How the Dollars Roll In Averages \$16.53 a Day



"Made 20 sales in 23 calls. Between the 13th and 28th of this month I have made \$248. Speedo has them all beat for real money."

R.A. Stewart, N.Y.

Delighted with Speedo

"Received my Speedo outfit and am very delighted with it. I demonstrated one hour today and took 5 orders."

B. R. John, Ida.

14 Orders in 2 Hours

"I now realize the Speedo articles are the best ever—sold 14 orders in 2 hours at Grand Canyon."

J. J. Corwin, Ariz.



Revolutionary New Sharpener

Works like magic. Puts a razor edge on any knife or tool in a few seconds. Anyone can use it. Sharpens scissors, too. The coupon brings full details.

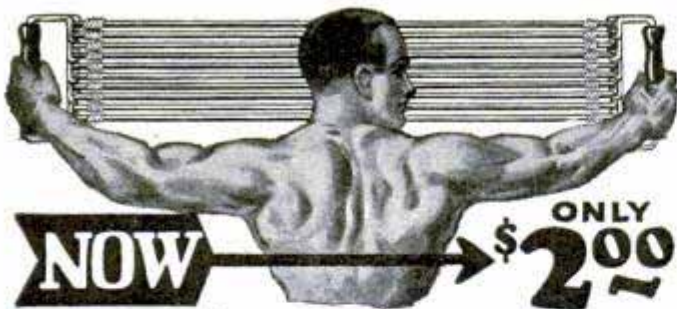
Central States Manufacturing Co.,
Dept. E-700, 4500 Mary Ave.,
St. Louis, Mo.

Tell me how I can make \$75 to \$150 a week through your Free Test Offer.

Name.....

Address.....

Town..... State.....



Giant Chest Expander and Progressive Exerciser

Be a muscular marvel. Have the muscles of a superman. Become strong for your health's sake or to astound your friends with extraordinary feats which only men of giant strength can do. In a few short weeks you will easily do stunts which now seem difficult—then real muscles and strength will be yours—and yours to keep.

**Send No Money
Use This
Money
Saving
Coupon**



How the Giant Chest Expander and Progressive Exerciser Is Made

The Giant Chest Expander and Progressive Exerciser is made with new live, springy rubber so as to give it long wearing and great resisting qualities. Do not pay more for an exerciser that has forty or less rubber strands to each cable. Get the best and most durable. The Giant Progressive Exerciser has 50 strands of the finest rubber procurable to each cable.

Free Instructions

We do not think it enough to send you an exerciser worth double what we ask, but for a limited time, we will also include instructions absolutely free. These instructions are interesting and simple to follow—they show you the short cut to health and strength. Order today before this wonderful offer is withdrawn.

Your Guarantee

The Giant Chest Expander is sold with a guarantee that you will say it is the finest you ever saw or your money back.

**5 Cables or double 10 Cables
for strength for \$2**
The double strength exerciser has resistance of over 200 lbs.

How to Order—Send No Money
Sign your name and address to coupon below and get your Giant Exerciser at the present low introductory price by return mail. The price is made low because we want everyone to enjoy muscles and strength at the lowest possible cost. Don't pay more—order from us—get the most for your money. Use coupon now.

PROGRESSIVE EXERCISER CO.,
4005 Langdon Bldg.,
Broadway and Duane Street, New York

Please send ☐ Your 10 cable Progressive.
☐ Your 5 cable Exerciser.

Check the Exerciser you want, and it will be sent you by return mail. Pay postman introductory price, plus few cents postage on arrival. It is understood that if you are not entirely satisfied with your exerciser you may return it within 5 days and get your money back.

Name.....

Street.....

City..... State.....

If you live outside the United States, send cash with order.

MASTER THE TENOR BANJO —by CHORDS



JOHN MARTELL, popular radio artist and instructor, has compiled this new method of instruction for you.

\$7.00

Brings this complete course to your home in 12 weekly lessons—written so you can understand them. No previous knowledge of music necessary.

Enroll now and make progress while others are thinking it over.

Easy terms—10% off for full payment on enrollment or \$2.00 down and \$1.00 each week. Special Banjo offer on request.

Write **NEW YORK INSTITUTE OF MUSIC**
Dept. 104 143 East 34 St., N. Y. C.



A Snow Storm Produced in a Few Moments in Any Room

No Equipment required—just a little tablet creates the Wonder. It Gathers and Baffles the Crowds. The Hit at any party. **Wild Demand Whenever Shown.** Agents Wanted. Sample and quantity prices 10 cents.

KELLER, MARTELLE CO.
Studio A214, 245 W. North Ave., Chicago, Illinois



Be a drummer!

Trap Drumming made easy in a short time. Our free instruction course furnished with genuine Ludwig Trap-Drum Outfit. Develop your natural sense of rhythm. Go to your nearest dealer or write for full details.

LUDWIG & LUDWIG, 1611 North Lincoln Street, Chicago

Big Money for You as an Automobile Mechanic

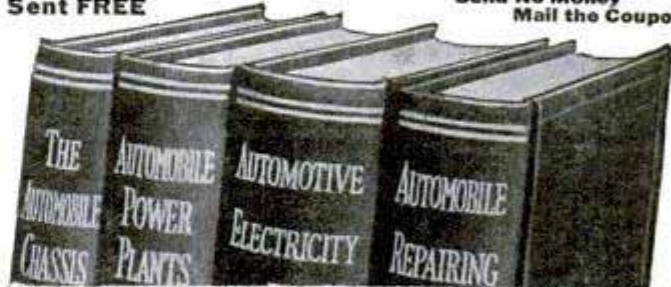
These four practical books, written by five well known teachers of automobile practice, will teach you right in your own home during your leisure time just what you need to know about automobile troubles and repair. They will teach you automobile construction, maintenance and repair as experts know them and will help you to earn an expert's pay.

Practical Automobile Library: Four Books—\$1.50 in 10 days and \$2 monthly for 6 months—only \$13.50 in all!

Hundreds of question-answering diagrams—hundreds of clearly-marked illustrations—make the books plain and readily understandable. All the explanations and descriptions are clear, simple, direct. Every chapter is packed with definite, step-by-step, how-to-do-it information. Here is your opportunity to enter a big-pay field.

Sent **FREE**

Send No Money
Mail the Coupon



FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York

Send me for 10 days' free examination the New Practical Automobile Library. If satisfactory, I will send you \$1.50 in 10 days and \$2.00 monthly until the special price of \$13.50 is paid. If not wanted, I will return the Books at your expense.

Signed.....

Address.....

City and State.....

Position.....

Employer..... P. M. 5-1-27



TROUBLE LAMP SELLS ON SIGHT

Men! Here at last is the perfected auto trouble and service lamp—three steps ahead of the field. It has more uses, sticks more firmly in place, has double the magnetic power. Makes possible a far more convincing demonstration. Sold under our own Two-Way Selling Plan. Right now, the big auto and touring season, is the clean up time.

BIG SEASON NOW

WE do not believe in extravagant claims to salesmen. And we don't have to make them with a proposition like this. We are just going to give you the facts—and let you decide for yourself. And then we are going to quote a few of the hundreds of actual letters from Salesmen—original letters which we have in our files and can show anybody, at any time.

Fits Any Car

The Burns Magnetic Light plugs into a light socket on any car. "Magnetic" means that it sticks to any iron or steel surface. It's an emergency lamp for reading maps, for repairing tires or engine trouble—it has endless uses. Can be demonstrated anywhere because it sticks to radiators, stove, typewriter, scale, knife or any similar metal article—so you don't have to have a car to sell it.

Sell Dealers—

\$50 From One Sale

One of our men, Shaffer, actually made \$67 in one day selling to car owners. But that's only one of your big markets. Sell to dealers—auto accessory shops, garages, battery stations, hardware and electrical stores. Grab at this red hot seller quick.

I'll Show You How

Don't send a penny. Just write and learn the full details of our Two-Way Selling Plan and how you can get a Burns Light on 10 days free trial. I'll tell you exactly how Hicks made \$195 in six days, Preston \$22 in fifteen minutes, and Shaffer \$67 in one day. No cost. No obligation. Simply mail the coupon.

CONSOLIDATED SPECIALTIES CORPORATION, Dept. 14-E
21 West Elm Street
CHICAGO, ILLINOIS

—MAIL THIS TODAY—

Consolidated Specialties Corp., Dept. 14-E,
21 West Elm St., Chicago, Illinois.
Yes, send me right away without cost or obligation all the facts about the Burns Magnetic Lamp and your Two-Way Selling Plan.

Name.....

Address.....

City..... State.....



STICKS JUST WHERE YOU WANT IT

Magic Auto



\$106.95 in 4 Days

Please ship by express 100 more lights. I have only seven lights left out of the 100 received last Monday. Hicks.

22 Sales in 15 Min.

Preston writes: "The lights go like hot cakes. I sold 22 in 15 minutes the first day. Every car owner tells another."

Orders 1500 at a Time

C. J. Irwin: "Please tell us when we can expect the balance of 1,500 ordered. We can sell 1,000 to 1,500 a week."

Learn Drafting in 4 Months

CHICAGO TECHNICAL COLLEGE

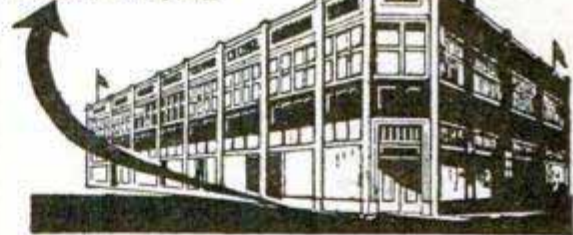
If you are earning less than \$50 a week, here's a vital message that concerns you. The field of Drafting needs wide awake men quick . . . men who are serious about their future. 4 months from today you can be firmly established in drafting's fertile field. Young men with this training earn \$60 to \$100 a week . . . and more.

Here is interesting work. Contact with big business, big men, real go-getters. "Send us more draftsmen" is the call that comes to us, from engineering, electrical and architectural firms, railroads and the country's great building industry where billions are being expended each year. Train with us and you hurdle the low pay handicap. Earn big money. Better living. More for you . . . more for your family.

FREE 72-Page Book

Find out about this 23-year old school. The organization, men behind it, and our short time courses in Engineering, Electricity, Architecture and Building. This book gives you the facts you want to know. Gives you a vivid picture of the important part you can play in a surging industry. You will want this book . . . will need it. Just mail the coupon. It costs you nothing.

23rd Year



In Spare Time At Home

If you can't come to Chicago, learn Drafting at home. Your spare time is enough. Same practical course. Same short-cut methods. Quick, easy—yet thorough.

TRIAL LESSON

FREE

Test yourself and see how easy to learn Drafting by Chicago Tech method. Trial lesson sent FREE if interested in home-study. Mark coupon.

In 4 Months at Chicago Tech

Spend 4 happy months at Chicago. Center of engineering progress. Here at this old established and well known school for engineers and draftsmen. 16 weeks of fascinating study and you leave for home. All set to make big money. Equipped to reap rich rewards. Specially trained to enter a field seething with opportunities. A common schooling is all you need. Practical instructors. Part time work available; earn while you learn. Free employment service. Living accommodations arranged for. Day or Evening Classes. Athletics. Enter any time. Graduates quickly get good jobs. Take the step that has meant so much to thousands of our graduates . . . and will mean as much to you. Send no money, just fill in coupon and mail now, today.

MAIL COUPON TODAY

CHICAGO TECHNICAL COLLEGE

Dept. E-400, 118 E. 26th St., Chicago, Ill.

Please send me, without obligation, free and postpaid, your 72-page Blue Book and facts about how to qualify for a good drafting job in 4 months.

Name.....

Address.....

Town or City..... State.....

Age..... Occupation.....

☐ At Chicago Tech. or ☐ by Home Study. Mark choice with an "x"

CLIP and MAIL COUPON - NOW



I Can Teach You to Sing Like This!

I do not mean I can make a Caruso out of every man, or a Mary Garden of every woman—BUT I can teach you in a few short months a basic secret of voice development which Caruso discovered only after years of persistent effort.

Here is the secret! Biographers of the great Caruso tell us of his wonderful tongue control. Caruso himself speaks of it as the secret of vocal power and beauty. But tongue control depends entirely on the hyo-glossus muscle (shown in the illustration). Professor Feuchtinger has discovered the way to isolate and develop this muscle. You can benefit by his system of simple silent exercises, and do in a few months what it took Caruso years to accomplish.

If you are ambitious to sing, speak, or merely improve your voice, here is your opportunity. If you suffer from stammering, stuttering, or any vocal defect, here is a scientific method of relief. The course is ideally adapted to correspondence instruction. You can practice in the privacy of your own home.

100% Improvement Guaranteed

Thousands have already received the benefits of the "Perfect Voice" method. You can do it, too. If your voice is not doubled in power and beauty, your money will be refunded.

Free Book Send today for the Professor's book on voice production. It will open your eyes to the possibilities of your own voice.

Perfect Voice Institute

1922 Sunnyside Ave., Studio 13-55, Chicago

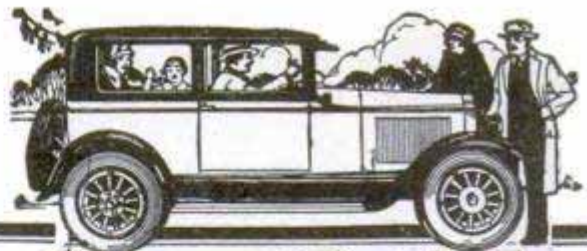
Please send me FREE Professor Feuchtinger's book, "Physical Voice Culture." I have put X opposite the subject that interests me most. I assume no obligation whatever.

☐ Singing ☐ Speaking ☐ Stammering ☐ Weak Voice

Name.....

Address.....

Age.....



Win a Buick or \$1500 in cash

SOLVE THIS PUZZLE

BLICK

Send No Money

The funny lines above form parts of five letters. Draw four straight lines to complete the letters and spell the kind of a car you would like to own and drive. Then send me your answer right away and I will immediately award you 25,000 votes and tell you how to win, absolutely free, a latest model Buick Sedan worth \$1,195.00. We are also giving away a Chevrolet Coupe worth \$625 and many other valuable prizes and hundreds of dollars in cash. In case of ties duplicate prizes will be awarded each one tying.

\$305.00 Extra for Promptness

In addition to many Grand Prizes a special prize of \$305 in cash will be given for promptness. Winners may have cash instead of prize won, if preferred. First prize winner can have \$1,500 cash or a Buick Sedan worth \$1,195 and \$305 in cash. Hurry! Solve the puzzle, clip this ad and send it to me right away with your name and address plainly written. Everybody rewarded. Address:

William Leroy, Dept. 1775, 315 S. Peoria St., Chicago, Ill.

NOW YOU CAN STUDY MUSIC AT HOME

earn
\$75.00
to
\$200.00
each week

With a nationally famous artist as your teacher you can learn to play classical or popular music on your favorite instrument. We guarantee our personal teaching method. Both advanced and elementary courses.

Write for catalogue
CONN NATIONAL SCHOOL OF MUSIC, INC.
506 S. Wabash Ave., Dept. 516, Chicago



BE AN OFFICER in the U.S. Coast Guard \$1700 Up to \$7,500 Yearly

\$780 yearly at the U.S. Academy while training. You rank Ensign to Captain in service. Age requirements 18 to 22. Write Dept. D, for information.
COAST GUARD PREPARATORY SCHOOL
4000 Ga. Ave. N. W. Washington, D. C.

SCIENCE FINDS NEW DRUGLESS GLAND STIMULANT

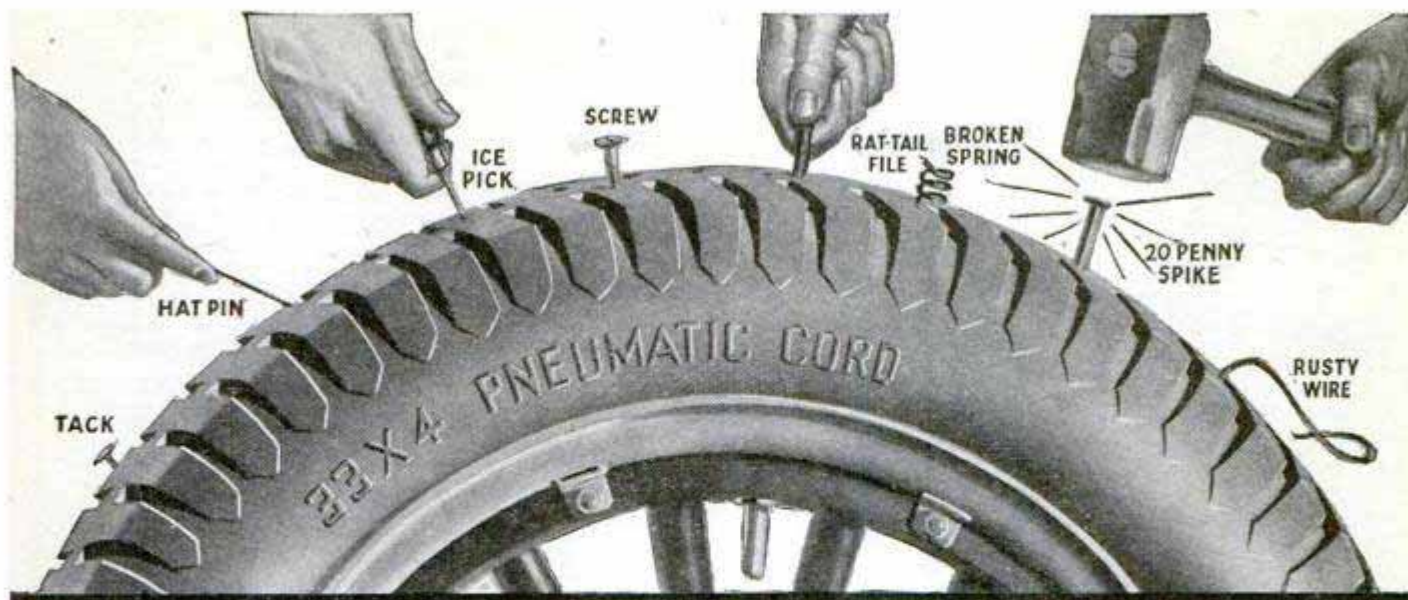
Science has discovered a new method of applying a positive-nature force. The method is wholly different—a tremendous step forward in regaining prostate gland health. Amazing effects produced in thousands of men, many beyond sixty.

"A hundred years ahead of modern medicine," writes a New York physician. Doctors and osteopaths are using and prescribing it. No drugs, medicine, massage or violet rays. Absolutely safe.

Does what Gland Tablets can never do. Directly stimulates prostate gland and often restores it to normal size and functioning in six days! Also tones up entire system, usually routs constipation and piles. Bladder weakness and frequent painful urination relieved in most cases. These results are unconditionally guaranteed.

Scientist's FREE Book, "Why Many Men Are Old at Forty," explains these amazing facts. This book is now FREE. No obligation at all. Simply ask for FREE Book.

THE ELECTRO-THERMAL CO., 2169 Main St., STEUBENVILLE, O.
Western Address: Suite 21-M, 303 Van Nuys Building, Los Angeles, Calif.



Astonishing New Discovery Seals Punctures Instantly

Good-Bye Tire Troubles! You Ride on Air Just as Before—But Without Fear of Changing Tires or Patching Tubes. Aer-Pruf Seals Punctures Automatically—While You Drive. Absolutely Sensational! Read Inventor's Amazing Free Sample Offer Below.

857 Nails in Tire—LEAKS NO AIR

HERE is an amazing new invention that makes any tire puncture proof—and adds 100% to the joy of motoring. Experts claim it is the greatest auto discovery in the past 10 years. And automobile owners everywhere are simply delighted.

Punctures Sealed While You Drive

This wonderful, new, scientific discovery—the work of O. S. Nelson, of South Dakota—is called Aer-Pruf. Under test, it held air into an old tire punctured with 857 nails—without a single leak! It seals punctures the instant they happen—so that you go spinning along without even knowing you have a puncture! It does away with changing tires and patching tubes either in the garage or on hot, dusty roads—in blazing sun, in drenching rains, on dark nights, in freezing snow storms! No wonder it appeals to every motorist, without exception! Aer-Pruf will seal punctures as large as a twenty penny spike or as small as a tack. You ride on air just as before—but with protection against “flats,” leaks, etc. Aer-Pruf will not freeze in zero weather and will resist the heat of the hottest summer day. It has no injurious effect on casing

or tube. Will last lifetime of the tube or tire. And only a few minutes are required to puncture-proof four or five tires with Aer-Pruf.

Rejuvenates Old Tires

Aer-Pruf puts new life into old tires and prolongs their usefulness in an astonishing way. It seals troublesome slow leaks, valve leaks and porous tubes. It prevents rim cuts, and cracked side walls. And it actually doubles tire mileage because it prevents driving with partly flat tires—the biggest cause of tire troubles! When Aer-Pruf accomplishes such wonderful results, is it any wonder that automobilists in every state in the Union are uniting in universal praise for this surprising invention?

Free Sample Offer Now, to introduce his new invention, Mr. Nelson will send you samples at his own risk. But that's not all. He offers to pay you for testing Aer-Pruf if you are not amazed and delighted with results! This surprisingly generous offer is limited—so take advantage of it without delay. See for yourself how astonishing this new discovery really is! No obligation. Clip the coupon at once. Mail it today!



AGENTS \$150 a Week

The demand for Aer-Pruf is simply startling. Agents handling this sensational discovery are making money hand over fist. J. O. Bright made over \$29 in two hours. Henry J. Dubois netted \$9 profit the first 5 minutes, just showing it to friends. Most amazing thing to demonstrate you ever saw. Simply drive nails into an old tire in front of interested crowds. Nine out of ten auto owners want to buy on first sight. No sales experience needed! Splendid for spare time workers. Send coupon below for generous proposition.



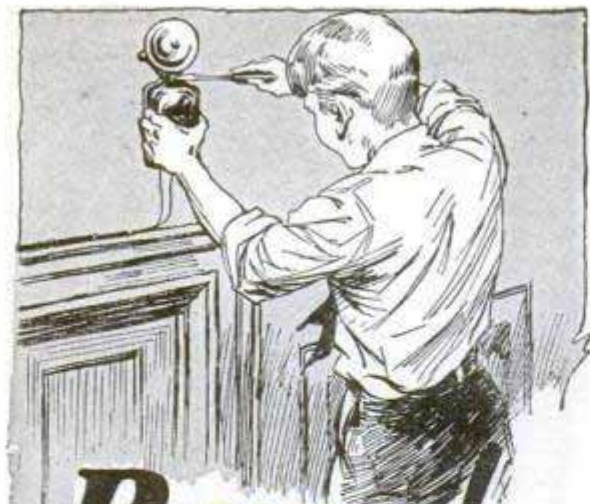
AER-PRUF
MANUFACTURING CO.

D-3213 Logan Building, MITCHELL, S. DAKOTA

AER-PRUF MFG. CO.,
D-3213 Logan Bldg., Mitchell, South Dakota

Please send me full details of your FREE sample offer and your offer to pay me for my time in testing this sample if I am not amazed and delighted with it. Give me full particulars of your agents' proposition.

Name.....
Address.....
City..... State.....



Boys!

Electricity is Fun and Pays Big Money

Young fellows who aren't even out of school are making good money doing spare-time electrical work, many of them earning \$10 to \$15 every week! These boys are no different from you except that they are "Cooke" trained. This famous Course in Electricity shows them how to do the things that only the expert can do, and fits them for a fine Big-Pay Job in this wonderful field after school days are over. Thousands of "Cooke" trained boys earn \$70 to \$200 a week.

Learn Right at Home

**5 BIG
WORKING
OUTFITS
including
a REAL
MOTOR**

With "Cooke" training you learn electricity in spare time. It doesn't interfere with school work or with your regular job if you are working. And you will find it so enjoyable that it will be more like play than study. The small cost is more than offset by the spare-time earnings we show you how to make.

\$800 for Spare Time Work!

"For three years I carried on my high school work and completed your Electrical Course at the same time, but by doing electrical work in my spare time I made between \$800 and \$900."

Robert F. Trail,
Harper's Ferry, W. Va.

**YOU
LEARN
TO BE A
RADIO
EXPERT**

Ambitious boys who are determined to be "somebody" when they get out in the business world, will find "Cooke" training just the thing. With the Course go five dandy Working Outfits—all the tools and apparatus you need—including a real electric motor. Enough equipment in this fine layout to enable you to tackle any kind of a spare-time job. Imagine having all this for "keeps"!

FREE OFFER TO BOYS

neering Works Review."

Mail the coupon and not only will we send you our big 64-page illustrated book, "Secrets of Success in Electricity," but we'll also enter your name for a three-months' subscription to a real Electrical Magazine, "Chicago Engineering Works Review." All this is FREE. Mail coupon today!

Use this SPECIAL OFFER Coupon

Chief Engineer Cooke,
L. L. Cooke School of Electricity,
Dept. 015, 2150 Lawrence Ave., Chicago, Illinois.

Send me free your 64-page illustrated book, "Secrets of Success in Electricity"; also enter my name for a three-months' free subscription to your big electrical magazine. This will not obligate me in any way.

Name.....

Address.....

(This coupon only for use of boys 15 years old or more)

GIVEN



\$20 Musical Instruments

Your choice of a Violin, Tenor Banjo, Hawaiian Guitar, Banjo, Cornet, Ukulele, Banjo Ukulele, Guitar, Mandolin or Banjo Mandolin. You will be proud to own any one of these instruments and we will give you one without cost. A few cents a day for lessons is your only expense. Our system of teaching is so easy that you can play several pieces by note with the first four lessons. We guarantee success or no charge. Instrument and lessons sent on one week's free trial. Write for booklet today, no obligation. Over 200,000 satisfied pupils.

CHICAGO CORRESPONDENCE SCHOOL OF MUSIC, INC.

1632 North Halsted Street, Dept. 344, Chicago, Illinois.

LAW

Personal Instruction

By Mail Be a lawyer

or law trained

businessman. Qualify

to earn \$2,500.00 to

\$15,000.00 a year.

University Methods. TUITION LOW. EASY TERMS. Textbooks furnished. Practical and authoritative non-resident course. Endorsed by bench and bar. Prepares for bar or business. Over 60,000 students. PERSONAL INSTRUCTION. Guarantee to coach free any graduate failing to pass bar exams. Write today for particulars of low tuition offer now in force and book on law FREE. No obligation.

AMERICAN CORRESPONDENCE SCHOOL OF LAW

3601 Michigan Avenue, Dept. 1355 CHICAGO, ILL.



BART SUPPLIES

Quality art materials at lowest prices. Save on everything you need. Convince yourself—send today for catalog.

BART SUPPLIES, 442 Eustis Bldg., MINNEAPOLIS, MINN.

Rider Agents Wanted

Select from the 44 Styles, colors and sizes of Mead Bicycles. Models for every age. Ride and exhibit sample and make money.

30 Days' Free Trial We ship the bicycle you select On Approval for a month's trial. If not fully satisfied, return it at our expense. Prices from \$21.50 up.

Tires best quality, factory prices. Save big money on Lamps, wheels and equipment, low prices. Send No Money, do business direct with makers.

Mead CYCLE COMPANY
DEPT. G-110 CHICAGO

Write today for free Catalog, factory prices and marvelous new offer.



Send Your Name ~ Learn How to Earn \$1900 to \$2700 a year as a RAILWAY POSTAL CLERK

Here's a REAL job for you! \$35 a week to start. \$100 raise every year until you get top pay. Long vacations with pay. Other fine advantages.

Coupon Brings FREE BOOK

Your name and address on the coupon brings you full details of this wonderful position and others in Civil Service. Tells how Mr. Patterson coaches you to pass exams. Also read his money back agreement. Mail coupon today.

ARTHUR R. PATTERSON, Civil Service Expert
PATTERSON SCHOOL, 85 Wisner Bldg., Rochester, N. Y.

Send me without charge your catalog describing Railway Mail Clerk and other Civil Service positions.

Name..... Age.....

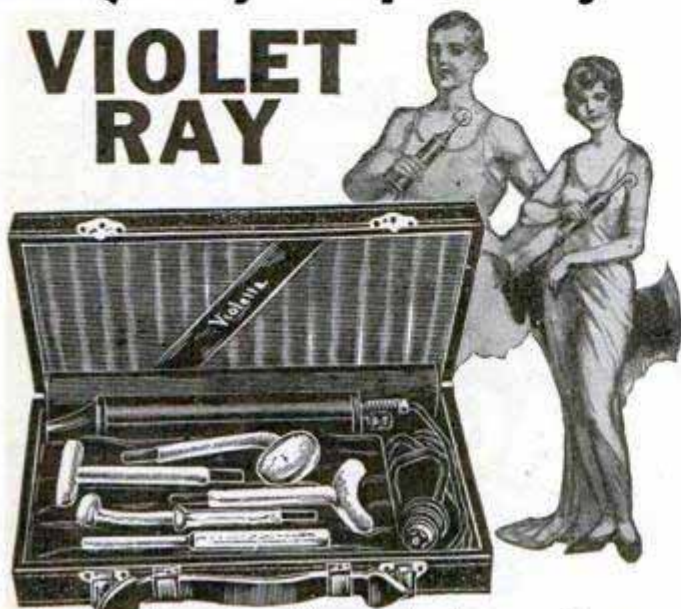
Address.....

City..... State.....

PAIN and DISEASE

Quickly Conquered by

VIOLET RAY



Let us tell you how thousands of men and women suffering from rheumatism, neuritis, paralysis, nervousness, skin diseases, headaches, constipation, sprains, prostate trouble, goitre and many other ailments, even hay fever and asthma, have found quick relief—new health and vitality with this marvelous, scientific invention. Pains vanish almost instantly.

Violetta

Ten Days FREE Trial

For Health—Beauty—Vigor

Endorsed and used by hospitals, sanitariums and physicians. Every home can now have one. Saves hours, days, months of suffering. No medicine. Painless, pleasant treatment. Only the violet ray can penetrate to every nerve affected. Simple, safe, painless—anyone can use VIOLETTA. Why suffer pain and poor health when you can try VIOLETTA 10 days FREE.

This Book FREE

Tells all about violet rays—how this marvelous discovery by Nikola Tesla, the electrical wizard, now brings this mysterious curative power to all. Contains many astounding testimonials from our thousands of satisfied users. Send for the facts and our liberal trial offer today. Mail the coupon now.

VL-REX CO., Dept. 531
2304 Warren Avenue, Chicago



VL-REX CO., 2304 Warren Ave., Dept. 531 Chicago

Please send me your free book on Violet Rays and details of your 10 days' free trial offer.

Name

Address

City State

Ailment

BIG

\$75 to \$150 Weekly—\$10 to \$25 Daily

WAGES

Become a
McSWEENEY
Trained
AUTO MECHANIC

Learn the ONE great "Open Shop" trade, get the kind of training that you can sell anywhere for BIG PAY. Become a trained Auto, Tractor and Electrical mechanic. No scabbing because no union to join. No strikes. No Apprenticeship. Steady work in America's greatest industry.

McSweeney graduates are earning up to \$10,000 a year. Learn in only a few weeks. Your money back if you are not perfectly satisfied.

No schooling required. No book study. Mac's SHOP WAY Means Bigger Pay. You learn with real tools on real equipment. Only McSweeney operates three great schools for training auto and tractor mechanics. Choose either school.

100,000 Men Wanted

—trained men who know how to keep America's 22,000,000 cars and tractors repaired. No other business offers such opportunities to men and boys.

SPECIAL!

Limited Reduced Price Tuition Offer Includes

Your Board and Railroad Fare

to Cincinnati, Cleveland or Chicago

No Extra Charges of Any Kind

The greatest, most liberal offer I have ever made. This offer will be withdrawn without notice. Don't miss it. Write quick for full particulars and my big 68-page book. Mail this coupon to my nearest school TODAY SURE.

McSWEENEY

AUTO, TRACTOR and ELECTRICAL SHOPS

Dept. 14TE, Cleveland, O., Chicago, Ill., Cincinnati, O.

Name

Address

City State

Make That Dream Come True!

Haven't you often pictured yourself playing the Hawaiian Guitar, a happy crowd around you, everybody enjoying and admiring your playing? Now you can reach your goal—and play all the latest hits just as the Hawaiians do!



You can play the **HAWAIIAN GUITAR** just like the Hawaiians!

\$15
HAWAIIAN GUITAR
with Genuine Seal Grain
Fabrikoid Cover
GIVEN
when you enroll



Get the advantage of expert instruction by Kolomoku, Kalaluki, Ferera and Seville—every one famous as both player and teacher. Even if you never touched a musical instrument in your life, under their direction you make rapid headway—you will be astonished when you see how easy it is!

This Sweet Toned Hawaiian Guitar

in genuine Fabrikoid Case—and complete playing outfit including picks, steel playing bar, etc.; given you when you enroll. Retailers ask \$15, or more for a similar outfit without the case. Remember, there are no extra—we furnish everything with the course.

Learn in Spare Time

Pick up your guitar at any time and play. Your lessons are always handy—you can always refer to them. You are never hurried or forced. And no waiting for a class to form—start now—go ahead as fast as you like.

Pay as You Play

Small first payment starts you. And the entire 52-lesson course comes in just a few cents a lesson! Begin now.

Tenor Banjo

and other courses—Violin, Tiple, Tenor Guitar, Banjo Ukulele, Ukulele—under well-known instructors. Write for information.

FIRST HAWAIIAN CONSERVATORY OF MUSIC, INC.

9th Fl., Woolworth Bldg., Dept. 348, New York, N. Y.

Approved as a Correspondence School Under the Laws of the State of New York

SEND THIS COUPON FOR LIBERAL OFFER!

First Hawaiian Conservatory of Music, Inc.

9th Fl., Woolworth Bldg., Dept. 348, New York, N. Y.

Please mail full information about your 52-lesson Hawaiian Guitar Course. I am not obliged to enroll unless I want to.

Name _____

Address _____

City _____ State _____

Complete Conservatory Course

52 complete lessons. Pictures explain every move. Our method is simple, practical and interesting—only 4 motions to learn. No tiresome scales and exercises—you play a real piece your very first lesson.

Expert Instruction by Native Hawaiians



Deafness

Perfect hearing is now being restored in all cases of deafness caused by Catarrhal troubles, Relaxed or Sunken Drums, Thickened Drums, Roaring or Hissing Sounds, Perforated, Wholly or Partially Destroyed Drums, Discharge from the Ears, etc.

Wilson Common-Sense Ear Drums

require no medicine but effectively replace what is lacking or defective in the natural ear drums. They are simple devices, which the wearer easily fits into the ears where they are invisible.

Free Book on Deafness

Soft, safe and comfortable. Write today for 168-page book on deafness giving full particulars and many testimonials. The hearing of thousands of grateful users has been restored by these "little wireless phones for the ears."

WILSON EAR DRUM CO., Incorporated
560 Todd Building LOUISVILLE, KY.



LEARN to PITCH

Lessons by "MATTY," ED. WALSH, "DOC" WHITE, WALTER JOHNSON, "NAP" RUCKER, "SMOKEY JOE" WOOD, PITCH THE FADE-A-WAY, SPITTER, KNUCKLER, SMOKE BALL, etc. Clearly Described and Illustrated by 56 Pictures. Entire COURSE OF LESSONS SENT POSTPAID for 50 cents.

BENEDEK, 2300 N. Mason Avenue, CHICAGO, ILLINOIS



Taught at Home

New! Different! Teaches you Big Tricks, Illusions, Stage Stunts, "Patter" and the Principles of Magic. Learn at home. Earn \$250 to \$1,000 a month. Write today for special offer. Tarbell System, Inc., 1926 Sunnyside Ave., Dept. 93-55 Chicago, Ill.

TELEGRAPH-RADIO

\$18 to \$35 a week while training for Radio and Telegraph Operator jobs at \$150 to \$300 per month. Write for particulars.

CHICAGO TELEGRAPH INSTITUTE
Dept. 1-5-7 1338 S. Michigan Avenue, CHICAGO

WANT WORK AT HOME?
Earn \$18 to \$60 a week RETOUCHING photos. Men or women. No selling or canvassing. We teach you and furnish WORKING OUTFIT given with each enrollment. Limited offer. Write today. Aircraft Studios, Dept. 60, 3900 Sheridan Rd., Chicago



RESHAPE your NOSE
to beautiful proportions—while you sleep!



Gold Medal
Won 1923

ANITA NOSE ADJUSTER

is SAFE, painless, comfortable. Speedy, permanent results guaranteed. Doctors praise it. No metal to harm you. Small cost. Write for FREE BOOKLET.

ANITA CO., Dept. E-12 ANITA Bldg., NEWARK, N. J.



BEFORE-AFTER

BUCHSTEIN'S FIBRE LIMB
is nothing to your stump—strong, cool, neat, light. Easy payments. Braces for all deformities. D. BUCHSTEIN CO., 610 3rd Ave., So. MINNEAPOLIS, MINN.

GET OUT OF YOUR RUT
Make your dreams come true! Increase your income. Better your position. Restore the joy of living and doing. Tear yourself free from the fetters of the past. Strike for a new and brighter future! Membership with us shows you how. Full information on request. No obligation. It's free. Just write your name and address on a postal and send to us. NOW! **Self Improvement League of America** Suite 700, 75 Westland Avenue, Boston, Mass.



J. A. STRANSKY

Here's My Guarantee to Car Owners...

FREE GASOLINE OFFER

I will send you samples of the Stransky Vaporizer to test in your car. If you are not convinced that it will save you 1/4 of the gasoline you now use; that it will end carbon and spark trouble caused by excessive use; that it will increase the power of your engine; that it is absolutely harmless; and that it will safely and delight you in every way—

If it does not live up to the above—if it is unsatisfactory for any reason whatsoever—you may return it and I will refund every penny of the low

price you paid for it. What is more, I will pay a cash forfeit of one-half dollar if the test is unsuccessful, to compensate for the time you spend in testing it. This offer has already been accepted by over a million car owners.

L. G. STRANSKY, Vice-Pres.
J. A. Stransky Mfg. Co.,
Pukwana, So. Dakota.
Resources over \$500,000.

J. A. Stransky

Save 1/4 to 1/2 Your Gasoline!

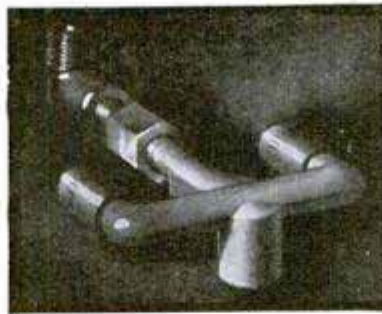
Or This Daring Trial is FREE

Accept this daring offer to test this amazing gas-saving device on your car—the test is free if unsuccessful in your opinion. Read below how it works—learn about money-making plan—Then mail coupon before offer expires.

\$75 TO \$200 IN A WEEK!

Think of running your car 1,300 miles without buying gasoline at all! J. R. Wood did that—ran 3,000 miles on the same amount he formerly used on only 1,700 miles. And thousands of car owners have reported mileage as follows: Ford, 20 to 40 miles a gallon; Chevrolet, 30 to 40; Nash, 19 to 22; Buick, 17 to 32—and so on. Many have used it for three to eight years and still praise its saving in gasoline, increased engine power and less carbon trouble. Over a million car owners have installed it.

No wonder it sells so quickly that Williams made \$48 in 3 hours. Cronk \$51 in an hour, Herrick \$157 in one day! You can make big money in full or spare time just showing this amazing device to car owners and letting them test it themselves.



How It Works

The Stransky Vaporizer was invented by J. A. Stransky, former candidate for governor of South Dakota. It is based on a newly discovered scientific principle that has been tested thousands of times by car owners, dealers, mechanics and other authorities. It has no delicate parts to get out of order. You can attach it in about three minutes and it needs no further attention. And it also cleans out carbon an astonishing new way.

Mail Coupon Below

If you do not save 1/4 to 1/2 your gasoline with this amazing device—the test doesn't cost you a penny—and you win a cash forfeit besides. Over one million car owners have accepted this test offer. Mailing the coupon below will bring you full details. You will also learn a definite \$75 to \$200 in a week plan. Your request will not obligate you. Rush the coupon today.

\$48 in 3 Hours

My gas bill has been cut in half. My engine runs as good as new. I went out Saturday about three hours and secured 16 orders.

J. A. Williams.

The STRANSKY VAPORIZER

Saves Gasoline

J. A. STRANSKY MFG. CO.
Dept. E-10 PUKWANA, S. D.

J. A. Stransky Mfg. Co., Dept. E-10, Pukwana, S. D.
Yes, send me full details without obligation.

Name.....

Address.....

City..... State.....



DO YOU LIKE TO DRAW?

It's Easy To Learn When Shown In The Right Way

Some of cleverest cartoonists and comic artists in America today learned how to draw quickly—by following **CARTOONIST EVANS' SIMPLE AND EASY METHOD**. This school is recommended by foremost cartoonists because they know the students are handled right. If you like to draw, send 6c in stamps for **portfolio of cartoons and full details**. The course is **NOT EXPENSIVE**.

The W. L. Evans School of Cartooning 821 Leader Building
CLEVELAND, OHIO

WANTED!

Ornamental Iron Draftsmen — at Big Pay!

Beginners can earn \$50.00 to \$65.00 a week. Good experienced men often command \$500 a month. Wonderful opportunities to become an executive. Not enough trained men in this work to meet the demand.

Get This FREE BOOK!

Shows how easily you can qualify for these high salaried positions while keeping your present job. No books, higher mathematics, or experience necessary. Free employment service when you're ready. Write today—

American Inst. of Ornamental Iron & Bronze, 3037 Hennepin Ave., Minneapolis, Minnesota



Better Handwriting

Easy learned, on wonderful new patented device. Children like it, adults pleased. Agents wanted. Sample 98c. Write for information today. VIC. HANSEN, WALLACE, IDAHO



Learn Tenor Banjo

BANJOISTS! Earn big money through Charles McNeil's famous Home Study Banjo Course. Simple as A B C—yet has all technical requirements. Includes phonograph record demonstrating jazz strokes, "breaks" and chords, played by Charles McNeil, 6 years with Isham Jones-Brunswick Records. Easy payments. Send for Free Book.

CHICAGO BANJO INSTITUTE
Dept. 1355 3345 N. Lincoln Street CHICAGO, ILL.

\$50 to \$300 Weekly

in Aviation jobs. Learn under actual flying conditions.

Send for **FREE BOOKLET** about Aviation and the opportunities in it for you.

CHICAGO AERONAUTICAL SERVICE, INC.
Dept. B 608 S. Dearborn St. Chicago, Ill.

Learn to PAINT SIGNS and SHOW CARDS

We quickly teach you by mail, or at school, in spare time. Enormous demand. Big future. Interesting work. Oldest, foremost school.

EARN \$50 TO \$200 WEEKLY

John Vasson, N. Y., gets \$25 for single show card.

Crawford, B. C., says: "Earned \$200 while taking course."

Send today for free information, samples and guarantee.

DETROIT SCHOOL OF LETTERING
150 Stimson Ave., — Est. 1899 Detroit, Mich.



Four Years Ago a National Automotive School Student—

Today—SALESMANAGER and a Success!

YOU can't make big money in the automotive industry until you've had years of practical experience—employers will warn you. And they'll urge you to get four years' experience in four months by going to National Automotive School and learning autos under experts. Train on half million dollars worth new automotive equipment. Employers want National trained men and our free employment service helps you get the job you want. You should make \$50 to \$200 per week after leaving National. Write for big

FREE AUTO BOOK

and read about the big pay opportunities National has for you.



NATIONAL AUTOMOTIVE SCHOOL

Dept. 609, 4006 Figueroa Street,
LOS ANGELES, CALIFORNIA



More Money Every Month



L. C. Eaton is now salesmanager of the Bakersfield Dodge Company in Taft, California. Four years ago he didn't know autos—then he trained at National and his rise has been sensational. A better job every few months with bigger pay. Now he is at the top and credits National Training for his success.

National Automotive School
Dept. 609, 4006 Figueroa St.
Los Angeles, Calif.

Tell me about your free employment service and opportunities in automotive industry. Send Free Auto Book.

Name.....

Address.....

City..... State.....

Sensational Typewriter Offer



The World's Only Ball Bearing Typewriter

NEVER has there been such a typewriter bargain on as easy terms! A genuine Silent Ball Bearing L. C. Smith at a 40% savings!

Only the L. C. Smith has all these features: Ball bearings (636 of them) at all points of wear. All the writing visible all the time. Non-shift carriage. 2-color ribbon. All the latest operating conveniences. Beautiful—renewed.

If you decide to keep it only \$3.00 DOWN BALANCE EASY TERMS

Guaranteed 5 Years

Money cannot buy a better typewriter. U. S. Government bought 50,000. The choice of railroads, big corporations like the Standard Oil Co., etc., because of its exclusive ball bearing feature. Easiest running, longest wearing of typewriters.

Send No Money!

Just mail coupon. Without delay or red tape, typewriter will be shipped you. Use it 10 days. See how speedy and easy it runs—the perfect work it turns out. If not delighted, return at our expense. You'll want to keep it. You can, for \$3 down and \$5 monthly. Now is the time to buy. \$3 worth of extras free. Send coupon now before offer is withdrawn.

40% SAVED by Using this Coupon
SMITH TYPEWRITER SALES CORP.
115-360 E. Grand Ave., Chicago

Ship me the L. C. Smith, F. O. B. Chicago. On arrival I'll deposit \$3 with express agent. If I keep machine, I'll send you \$5 a month until the \$68.70 balance of \$69.70 price is paid; the title to remain with you until then. I am to have 10 days to try the typewriter. If I decide not to keep it, I will repack and return to express agent, who will return my \$3. You are to give your standard 5-year guarantee.

Name

Address

City State

Employed by

Scatter-brained!

No wonder he never accomplishes anything worthwhile!



His mind is a hodge-podge of half-baked ideas. He thinks of a thousand "schemes" to make money quickly—but does nothing about any of them.

Thoughts flash into and out of his brain with the speed of lightning. New ideas rush in pell-mell, crowding out old ones before they have taken form or shape.

He is Scatter-Brained.

He pities himself, excuses himself, sympathizes with himself. And the great tragedy is that he has every quality that leads to success—intelligence, originality, imagination, ambition.

His trouble is that he does not know how to use his brain. His mental make-up needs an overhauling.

It is a known fact that most of us use only one-tenth of our brain power. The other nine-tenths is dissipated into thousands of fragmentary thoughts, in day dreaming, in wishing.

What can be done about it?

Find out by means of Pelmanism; then develop the particular mental faculty that you lack. You can develop it easily; Pelmanism will show you just how; 550,000 Pelmanists, many of whom were held back by your very problem, will tell you that this is true.

Pelmanism is the science of applied psychology, which has swept the world with the force of a religion. It has awakened powers in individuals, all over the world, they did not dream they possessed.

Among those who advocate Pelmanism are:

T. P. O'Connor, "Father of the House of Commons."
The late Sir H. Rider Haggard, Famous Novelist.
General Sir Robert Baden-Powell, Founder of the Boy Scout Movement.
Judge Ben B. Lindsey, Founder of the Juvenile Court, Denver.

Frank P. Walsh, Former Chairman of National War Labor Board.
Jerome K. Jerome, Novelist.
Gen. Sir Frederick Maurice, Director of Military Operations, Imperial General Staff.
Sir Harry Lauder, Comedian.
Baroness Orczy, Author.
Prince Charles of Sweden.

—and others, of equal prominence, too numerous to mention here.

A remarkable book called "Scientific Mind Training" has been written about Pelmanism. It can be obtained free. If you are made of the stuff that isn't content to remain a slave—if you have taken your last whipping from life—if you have a spark of independence left in your soul, write for this free book. It tells you what Pelmanism is, what it has done for others, and what it can do for you.

Let Pelmanism help you find yourself. Mail the coupon below now—while your resolve to do something about yourself is strong.

THE PELMAN INSTITUTE OF AMERICA

Approved as a correspondence school under the laws of the state of New York

19 West 44th St. Suite 65 New York City

The Pelman Institute of America,
19 West 44th St., Suite 65, New York City.

I want you to show me what Pelmanism has actually done for over 550,000 people. Please send me your free book "Scientific Mind Training." This places me under no obligation whatever.

Name

Address

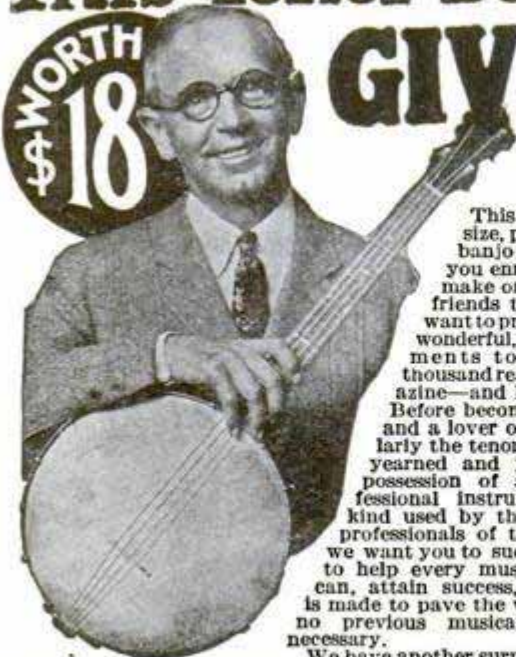
City State

This Tenor Banjo

WORTH
\$18

GIVEN

When You
Enroll



This handsome full size, professional tenor banjo is yours when you enroll. We want to make one thousand new friends this month. We want to present one of these wonderful, delightful instruments to each of one thousand readers of this magazine—and here's why. Before becoming a professor, and a lover of music, particularly the tenor banjo, Prof. Six yearned and yearned for the possession of a genuine, professional instrument, the same kind used by the big, successful professionals of the world. Now we want you to succeed. We want to help every music-lover that we can, attain success, and this offer is made to pave the way for you, and no previous musical knowledge is necessary.

We have another surprise for you! Not only do we start you on the way to popularity, success and fame by supplying you with an instrument that you can compare to any used or displayed in your town, but under personal supervision you will be given, by mail, the benefit of Professor Harry S. Six's twenty-two years' experience as director of Glee and Instrumental clubs of New York University. We don't just send you a lot of printed words and instructions and trust to luck that you will catch on. Our method is different and has proven to be the simplest devised by man—that is why we claim you'll be able to play in thirty minutes. Put us to the test.

Learn in 30 Minutes With My Picture Method

Arthur Brisbane, the highest paid journalist in the world, once said that "a single picture is worth a thousand words." He was right, for it stands to reason, when you take your instrument in hand along with the actual photographs of our professor in action as your guide, it is easy to imitate and do the right thing. But that is not all.

We also furnish as an additional guide, phonographic records of our professor playing the piece you are learning, along with our thorough, printed and illustrated, easy-to-read course.

Doesn't that sound easy? It is easy. If you could sit at our desk and see the letters and telegrams from our pupils we would be convinced that we have perfected the simplest, yet most highly efficient course to insure your mastery of the tenor banjo.



Don't Send a Single Cent

Investigate offer today. Don't put off until tomorrow, because you might forget and miss this wonderful opportunity. It might be the turning point in your career. Don't send a single cent. Just drop a line—use coupon or postal card will do—telling you are interested in receiving full particulars about course and to reserve one regular eighteen dollar, full size professional tenor banjo for you.

Act quickly, because there may not be enough banjos to go around for the million or more readers of Popular Mechanics. This does not obligate you in any way. Therefore, do not hesitate—put in your reservation now, this very minute. You will soon join our happy army of enthusiastic finished tenor banjo musicians.

EARN BIG MONEY

Hundreds have started orchestras and are making money.

FREE BOOKLET COUPON

New York Academy of Music
Studio 105-100 Fifth Ave., New York

Please rush all free information relative to your Tenor Banjo Course and reserve banjo for me. This obligates me in no way whatever.

Name.....

Address.....

City..... State.....

FORD OWNERS—LOOK! OVER 60,000 MILES OF PERFECT IGNITION

Latest Invention! —Positively Marvelous! "FORDYNAMO"

The FORDYNAMO is a complete high class ignition distributing unit to be used in place of the common timer on all Ford cars, trucks and tractors. Built on an entirely different basis. Does away with all roller contacts. No oiling or attention necessary. Gives an instant positive spark. Will not miss at any speed.

Users Say "It's Wonderful"

The most pleasing results are expressed in letters received from satisfied users, saying it is the most wonderful device put on a Ford car.

\$60 to \$120 a Week to Distributors!

Ordinary profits do not belong in this class. Here is a proposition that arouses the interest of every Ford owner to the buying point.

Be the First in Your Locality Of course we must give preference to the first person in each locality, so write today.

FREE Offer to Users Special Introductory Offer is extended to the first user in each locality. **Hurry! Be the first in your locality.**

Eclipse Timer Mfg. Co., 2924 Meinecke Ave., Milwaukee, Wis.

YOUR SCHOOL PROBLEM SOLVED THE RED BOOK WAY

Assisted by The Red Book Magazine Educational Department, every year thousands of parents choose a *better* private school for son or daughter. After an intensive seven year study of over 800 private schools in every part of the country, this department has a wealth of school facts and information at your immediate disposal.

Write in detail about your son or daughter. Give past schooling, individual characteristics and kind of school wanted. No obligation. Address

The Director, Educational Department
The RED BOOK MAGAZINE 420-A Lexington Ave.
NEW YORK CITY



Aviation

Take a W. A. C. Course in Applied Airplane Engineering. Many men earn \$2000 to \$10,000 a year. Big outfit of airplane parts when you enroll. Write for Free catalog. Aeronautical Training Division.

WESTERN AIRPLANE CORPORATION

"Dept. M-5" Monadnock Bldg. CHICAGO, ILL.



BOW LEGS and KNOCK-KNEES UNSIGHTLY

Those afflicted with BOW LEGS should wear the "PERFECT LEG FORMS" and overcome this deformity. Trousers hang perfectly straight. Made of the highest grade Aluminum. Sanitary, Light and Durable. Easy to put on or off. Send for booklet showing photos of men with and without the "PERFECT LEG FORMS."

PERFECT SALES CO.

40 N. Mayfield Ave. Dept. S Chicago, Ill.

NO JOKE TO BE DEAF

—EVERY DEAF PERSON KNOWS THAT

I make myself hear, after being deaf for 25 years, with these Artificial Ear Drums. I wear them day and night. They stop head noises and ringing ears. They are perfectly comfortable. No one sees them. Write me and I will tell you a true story, how I got deaf and how I make you hear. Address



GEO. P. WAY, Artificial Ear Drum Co. (Inc.)
80 Hoffman Bldg., 2539 Woodward, Detroit, Mich.

Learn To Fly From Men Who Know

We have taught hundreds of students. Many are now doing commercial work at large salaries. New air rates, mail and passenger, creating big demand for men.

Learn to Fly by Sweeney System

**An Actual Photo of One of Our Training Planes—
A SWALLOW**



**GROUND SCHOOL
FOR AVIATION
MECHANICS**

**BIG
MONEY
in Flying**

Aviation Mechanics—
\$50-125 Week
Riggers—\$50-\$75 Week
Flyers—\$125-\$225 Week
Taxi Service—\$100-\$300
Week
Aerial Photo Pilot—\$200-
\$250 Week
Special Messenger Service—
\$125-\$200 Week
Aerial Advertising—\$225-
\$500 Week
Crop Dusting—\$125-\$200
Week
Crop Survey—\$125-\$225
Week

Here's the great business of the future. The National Air Transport alone has invested \$700,000 on the Kansas City air route. They are spending \$1000 a day to operate an over-night service to New York City. Ambitious men are wanted as pilots and ground mechanics. You can go into postal, government, or commercial work. Flyers are in demand, earning big money at fairs, taking up passengers, etc., \$5 for a 10-minute flight is pretty fine pay!

If You Want to Be a Pilot

The student, if he wishes, goes into the air and qualifies as a pilot under safe and experienced pilots, with double controls for actual flying.

You take all the actual flying necessary to make you a competent pilot. Now when you understand that two to seven hours is all the average man needs to learn expert flying you will appreciate what this ample experience in the air under skilled men will do for you. Aviation is no longer a mystery—no longer a hazard; no, it is a business growing greater and more important. This has been wonderfully demonstrated in the successful flights over the North Pole.

**150 Acre Flying Field
Hangar and Club House
Instructors -
Thorough Construction Course**

LEARN TO FLY BY FLYING
Sweeney
SCHOOL OF AVIATION
3706 SWEENEY BLDG, KANSAS CITY, MO.

Sweeney Students Are

trained by DOING. Thorough ground school work, under skilled instructors in the construction and repair of planes, recovering wings, tuning motor, etc., learning everything about the mechanical work by actual practice. This fits you as an aviation mechanic. You can build your own plane and do anything required in aviation mechanics and construction and repairing when you have finished this work. You are thoroughly taught motors, etc., and work with thousands of dollars' worth of new material, including all types of engines. Aviation is now playing in commercial activities. Progress is rapid. More men are needed every day. You can qualify as a mechanic, or an engineer, or repair man, or builder; five men on the ground are needed for one man in the air.

SEND NAME TODAY for full details of this aviation mechanical course and photographs of planes and equipment actually used; also full information as to the commercial end of flying and opportunities for young men. No colored students accepted.

— — — — — "SEND THIS NOW" — — — — —

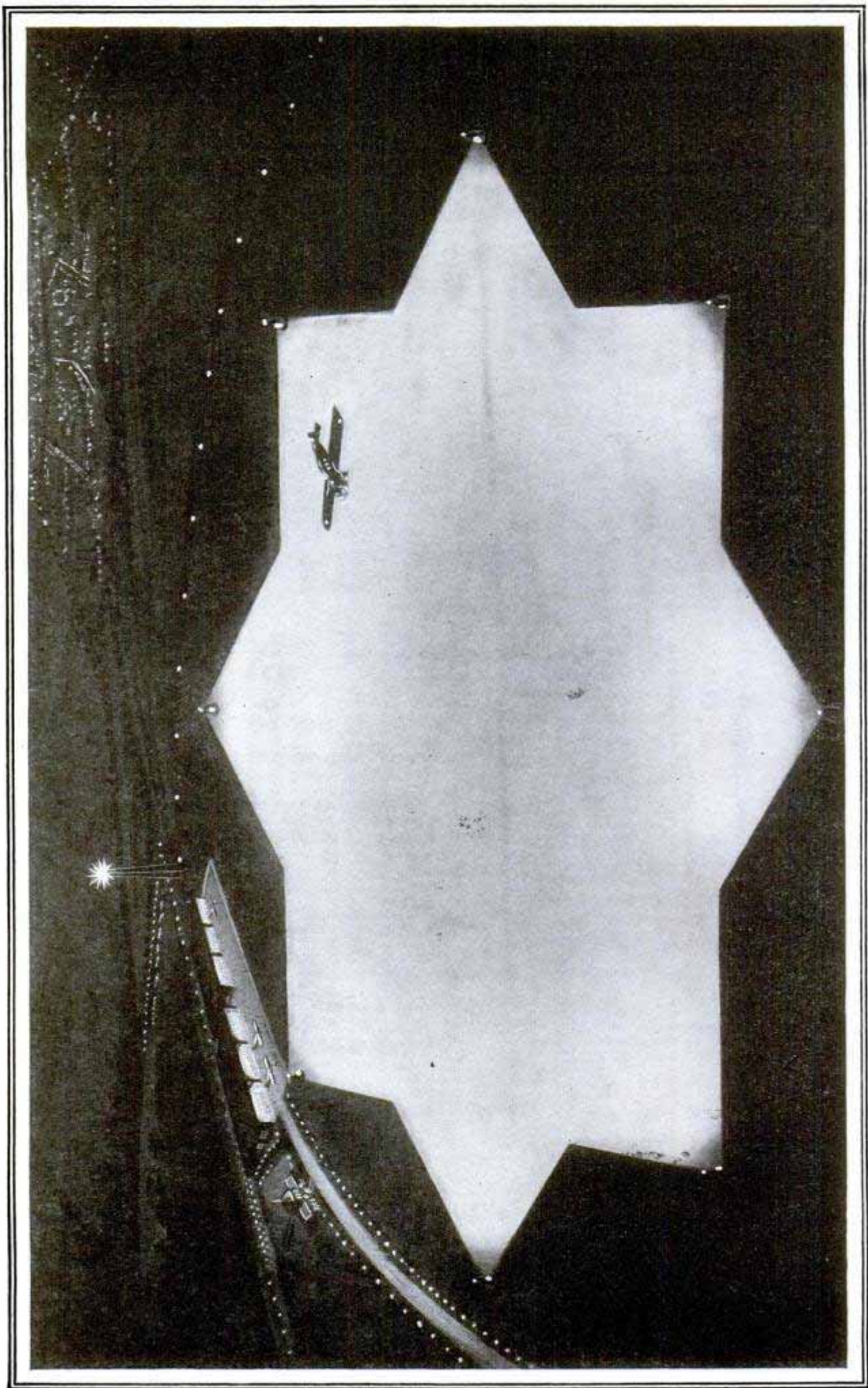
EMORY J. SWEENEY, President
3706 Sweeney Bldg., KANSAS CITY, MO.

Please send me full information about your Aviation Course.

Name.....Age.....

Address.....

Town.....State.....



Templehofer Airdrome, the Flying Center of Berlin, from Which Night Planes Leave Regularly for Moscow. Appears as a Giant Star from the Air. Since "Shadowless" Illumination Has Been Installed with Specially Designed Lamps That Cover the Vast Field with Even Light—See Page 722

Popular Mechanics Magazine

REGISTERED IN U. S. PATENT OFFICE

WRITTEN SO YOU CAN UNDERSTAND IT

Vol. 47

MAY, 1927

No. 5

Can Inaudible Sounds Kill? ¹⁸⁹⁵

American Inventor's Death Ray, Employing Ultra-Audible Sound Waves, May Spell Doom for Submarine Crews

SOUND waves, so far above the audible pitch that no ear can detect them, may drive submarines from the ocean in the next war. Prof. Robert W. Wood of Johns Hopkins university, the inventor, declares that all living matter, plant or animal, will perish when placed in the path of his ray.

The death sound, however, is restricted in its passage to two mediums, solid or liquid, and cannot be transmitted through the air. But, as it will pass readily through water and then through the solid hull of a submarine, its development may prevent the submersibles from ever again being a threat against peace.

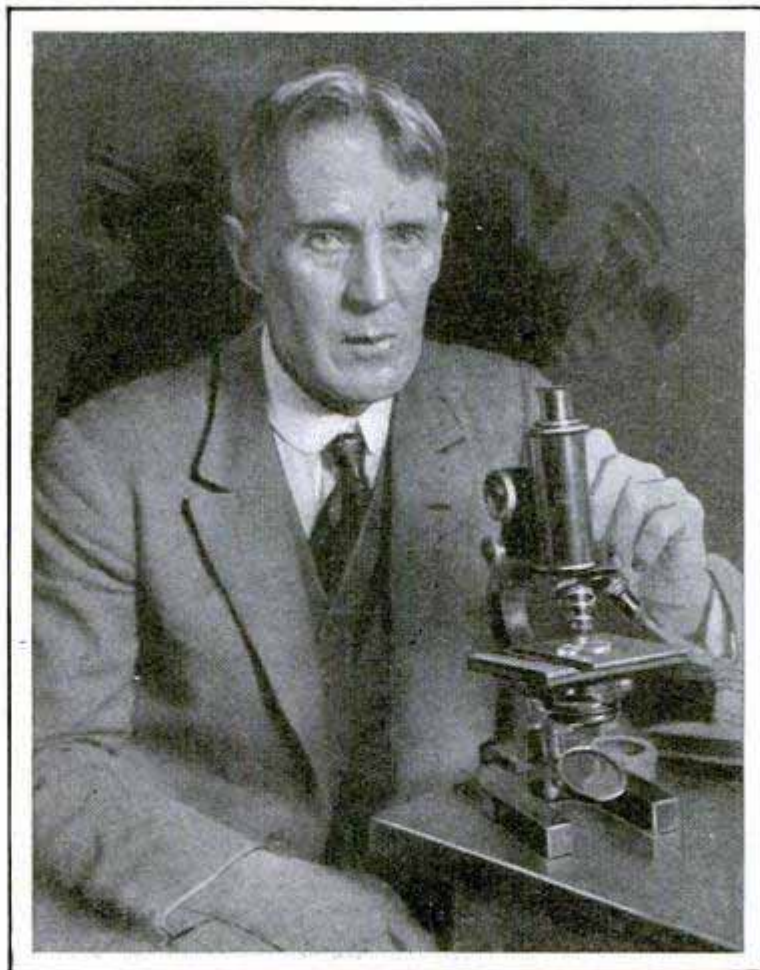
Sound, light and radio are all alike in that they consist of waves. Some of the sound and light waves are audible and visible, but, just as there are ultraviolet and infrared rays, which the eye cannot see, there are sound waves which

the ear cannot hear. The audible range of the average ear covers a band of from sixteen to about 15,000 cycles. Dr. Wood uses vibrations of 350,000 to 400,000 cycles a second. With them he has killed fish in tanks of water, and mice and other small animals, as well as plants.

Research, since the war, has begun to delve into the mysteries of the inaudible and invisible sound and light rays at both ends of the scale, those above and those

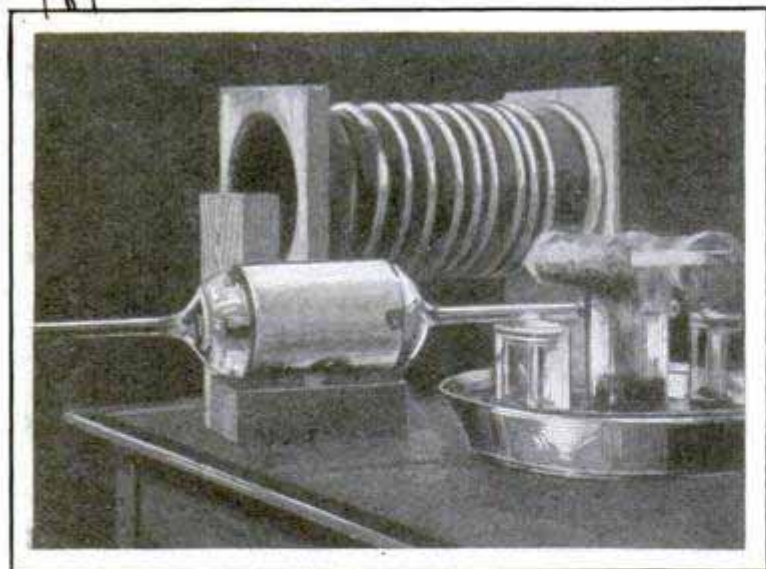
below the bands that are audible or visible. Infrared and ultraviolet light rays are being used by astronomers in taking celestial photographs; in a new English television apparatus; in a camera developed by the Japanese for taking photographs at night without knowledge of the enemy, and for many other purposes.

Radio manufacturers are studying sound waves at the extreme lower end of the audible band, in an effort to im-



Prof. Robert W. Wood, Who Has Perfected Apparatus That Kills Fish and Small Animals with Inaudible Sounds

*Johns Hopkins University 705
Baltimore Md*



Prof. Wood's Apparatus; a Piece of Quartz in the Tube at the Left Expands and Contracts to Produce Deadly Sound Waves

prove loud speakers, which have always been notoriously weak on deep-bass notes, and in France a fog signal has been erected to broadcast an inaudible sound, which will not disturb people on land, but can be picked up by ships at sea, and, with special apparatus, converted into an audible note.

The loud-speaker problem centers around the fact that the lower range of the average ear ends at about sixteen cycles a second, a sound produced by some organs, while the piano scale ends at twenty-seven cycles. But, below the lowest audible note on the organ, there are other notes, in themselves inaudible, but whose overtones play an essential part in faithful reproduction of the music. An inaudible note of eight cycles a second can be felt as a vibration.

The fog horn did not take a specially high vibration rate, as it was only necessary to get above the 15,000-limit of the ear, and a rate of 20,000 to 25,000 was not hard to attain with existing apparatus.

In Prof. Wood's experiments, however, he had to develop entirely new apparatus to produce from 350,000 to 400,000 vibrations per second, a rate that corresponds in sound to the high-frequency currents produced electrically by a Tesla coil. Unlike the high-frequency, high-voltage electrical currents, however, which are so harmless that several hundred thousand volts can be passed through the body without being felt, the inaudible sound waves have proved very dangerous. In the lab-

oratory experiments the apparatus used was not large enough to endanger human life, but a finger immersed in the tank of water through which the waves were traveling received a distinct tingling sensation.

Development of a "death ray" was one of the problems tackled by inventors during the war, and though several have since claimed success, none of their efforts proved fully successful when tried by experts. The latest report is of a new ray produced in France, for which complete success is claimed, that was tested recently in the engineers' barracks at Montpellier before French army

officers. The tests were guarded with great secrecy, but details that leaked out indicated that neither wireless nor any form of electric current was used. The inventor, a French officer, is said to claim that he can touch off mines at any distance and light or extinguish fires.

Prof. Wood's apparatus is unique in the manner employed to generate the sound waves. A high-frequency current, of 350,000 or more cycles a second, is passed through a piece of quartz, which contracts and expands as the current reverses its direction, giving the same effect as though the quartz were breathing. The expansion and contraction, while so slight as to be invisible, are sufficient to produce a sound, and, as they occur at such a high rate, the sound is inaudible. The quartz is immersed in a bath of insulating oil, from which the vibrations are transmitted to an adjoining tank of water.

SIGN TURNED BY TOY AIRPLANE TO ATTRACT ATTENTION

Propelled by an electric motor, a small airplane causes a sign over a western shop to revolve. The sound and motion attract considerable attention, and the cost of operation is small.



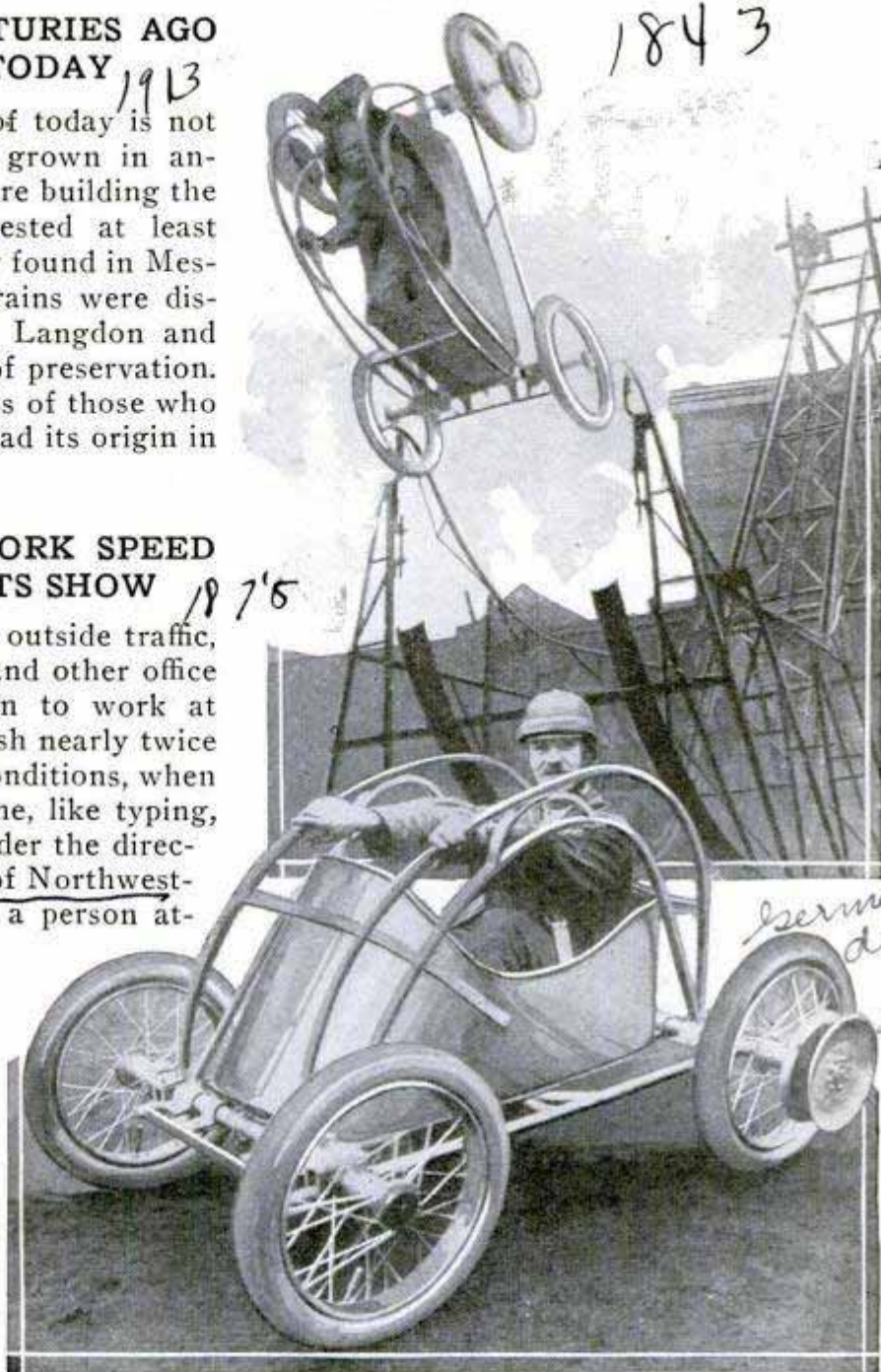
Cont. Carlton Isroak.
406 Laughlin St
71 Puller Oregon

WHEAT RAISED CENTURIES AGO LIKE THAT OF TODAY

Wheat from the farms of today is not much different from that grown in ancient Egypt when slaves were building the pyramids, specimens harvested at least 5,500 years ago and recently found in Mesopotamia indicate. The grains were discovered by Prof. Stephen Langdon and were in an excellent state of preservation. The find supports the claims of those who believe that wheat raising had its origin in that section of the world.

NOISE INCREASES WORK SPEED LABORATORY TESTS SHOW

Noises, such as those of outside traffic, ringing of telephone bells and other office sounds, stimulate a person to work at greater speed and accomplish nearly twice as much as under quieter conditions, when the task is a mechanical one, like typing, according to tests made under the direction of Prof. J. B. Morgan of Northwestern university. But when a person attempts to typewrite and at the same time think while bothersome noises are heard, confusion results, he declares. These, and other interesting findings were made from a series of laboratory tests with different subjects. In one experiment, a girl sat at a keyboard adjusted to write numbers from one to ten. As she pressed each key, a letter of the alphabet was exposed and a code directed the operator which number to press next. While the test was in progress, a phonograph was playing outside the room, bells were rung and a loud pounding was produced. When the noises were most intense, the girls talked in an effort to overcome the disturbances, their breathing was that of tenseness and an instrument showed that the keys were pressed harder when the sounds were loudest. The demonstration was continued for two hours. No measurements were taken, but Prof. Morgan observes that most persons are able to adapt themselves to noisy surroundings.



Going Up and Over, and a Close View of the Car, Showing One of the Flanged Rear Wheels That Help Prevent Accidents

PERIL OF AUTO LOOP-THE-LOOP LESS WITH FLANGED WHEEL

Turning a somersault in an automobile is still a risky stunt, but the hazards have been reduced to some extent by having the car run down the incline on flanged wheels which rest on narrow rails. This eliminates the likelihood of a false take-off due to poor steering. The apparatus shown here is said to have been used successfully in Germany.

Apple trees should have from thirty to fifty leaves to each apple.

2/20/27

GIRL INVENTS AIRPLANE MOTOR FOR RUSSIAN GOVERNMENT



© P. & A.
Miss Palmen at the Special Airplane Motor She Invented for the Russian Flying Service

Recognition in the form of an award has been given Miss L. Y. Palmen, a Russian girl, by her government for the airplane motor which she has invented. The engine develops twenty horsepower and is specially adapted to the requirements of the All-Russian conference of aerial and chemical defense. Miss Palmen has been engaged by the Russian government in the capacity of engineer-constructor and is one of the few women in the world to be trained along these lines.

ELECTRIC AID TO VIOLIN MAKER SAVES TIME AND LABOR

Electric appliances are common in various forms of ordinary woodworking, but not many persons realize to what extent they have been employed for such intricate tasks as the making of violin bodies. In a New York shop, electricity largely supplants the hand and eye in making musical instruments. Violin or guitar backs are shaped from boards by a motor-driven fretsaw, while an electric plane—a roller coated with sandpaper—lays the foundation for the final finish and polish

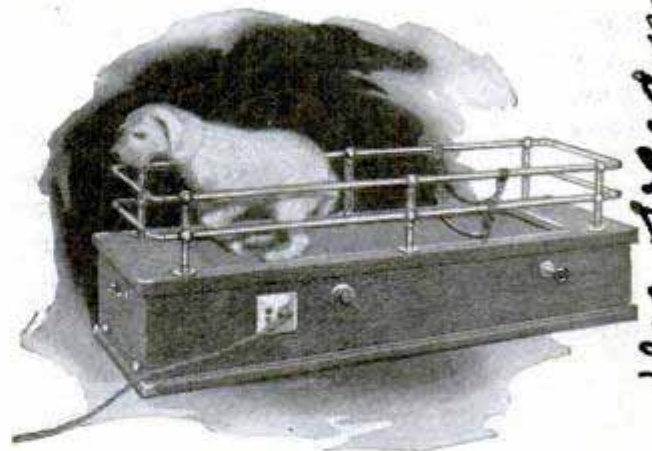
desired. One of the most interesting devices is a small unit which turns the curves in the sidepieces. It is merely a brass cylinder, electrically heated. The strips, planed and moistened, are pressed on the cylinder, the heat of which bends them.

FROG-LEG HUNTERS IN U. S. EARN FIFTY THOUSAND YEARLY

Catching frogs for market has become an activity of considerable economic importance in fifteen states, the total annual earnings for the hunters being about \$50,000, while the consumers eat about \$150,000 worth yearly. Live frogs are purchased at five cents to \$4 a dozen and the dressed legs yield the catchers from twelve and one-half to fifty cents a pound. In 1908, the whole of the United States reported 250,000 pounds of frog legs with a value of about \$42,000. Since that time, the demand from restaurants and hotels has greatly increased the consumption.

DOGS EXERCISE ON TREADMILL TO KEEP FIT

Dogs kept in confinement suffer from lack of exercise, especially when young and growing. To solve this difficulty and spare the owner the task of taking his pets for an airing in unpleasant weather, an electric treadmill has been devised. The dog stands on a broad belt rotated at various speeds by an electric motor supplied with current from a lighting socket. Running against the constantly moving band



© Fotograms

Road Work for the Dog on Electric Treadmill; the Moving Belt Can Be Run at Varying Speeds

gives the dog exercise nearly equivalent to that gained by a romp outdoors.

Used at Westminster
Kennel Club Show.

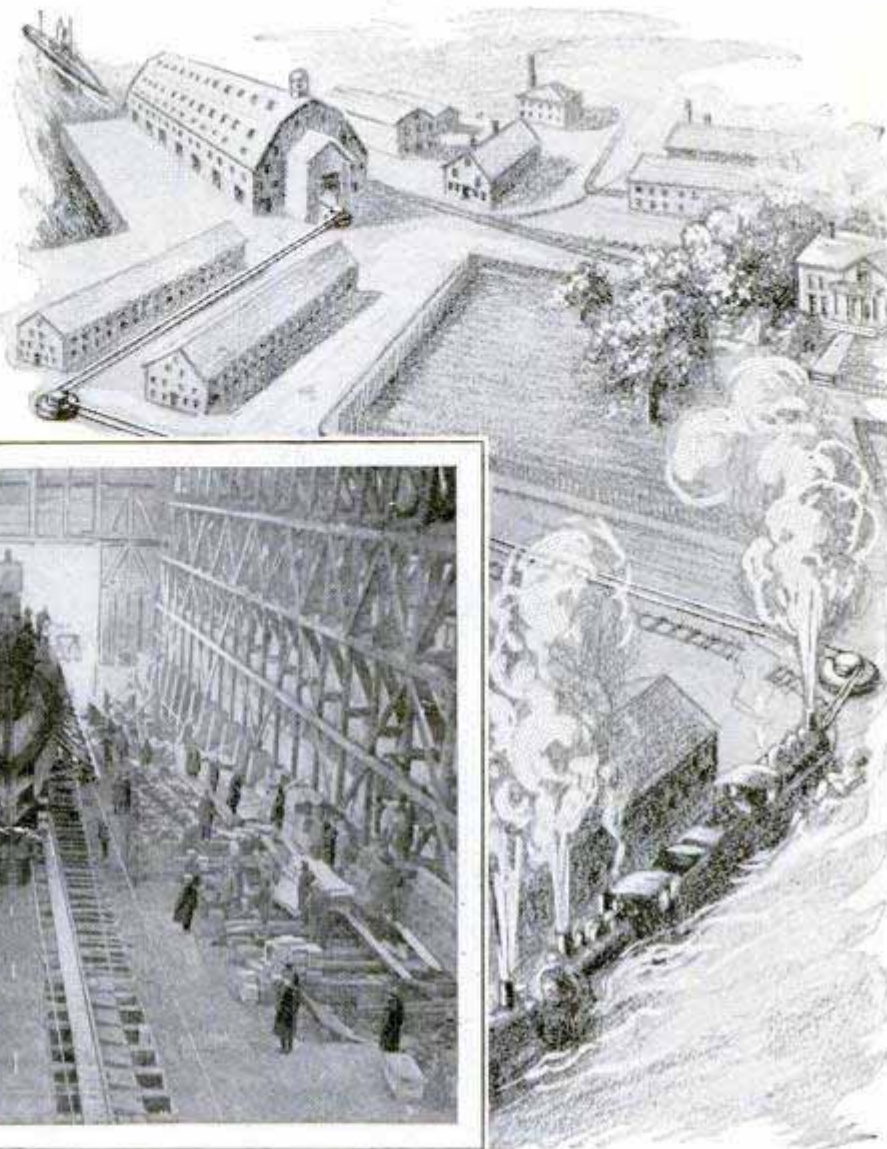
Cont. Edwin J. Jansie
The Farragut,
20... ..

very treadmill made by
messenger mfg. Co.,
Tatamy, Pa.

New York

LOCOMOTIVES DOCK "SUB" IN SIXTEEN MINUTES

For the first time in Atlantic coast naval history, a submarine was pulled out of the water and into drydock for repairs by railroad locomotives recently. The feat was accomplished with the aid of three switch engines at the Portsmouth, N. H., navy yard in the record



Submarine Entering the Drydock, and Sketch Showing How the Engines and Cables Were Arranged to Pull It Out; a Special Telephone Line Was Installed for Directing the Work

time of sixteen minutes and five seconds for the actual haul, the entire time being little more than half an hour. The submarine, "S-48," weighed between 600 and 700 tons without engines and auxiliaries. Nearly 7,000 feet of one-inch special steel cable was used, together with tackle made for the job, and the engines traveled about

2,500 feet from the starting point to complete the task. Directions were relayed along the line through a special telephone system connecting the ship house with signal points some 1,500 feet away. A truck frame was used to keep the cable off the ground as much as possible while the engines moved.

RESEARCH CUTS GASOLINE BILL HUNDRED MILLION YEARLY

Tests by the bureau of standards to determine the best grades of gasoline for motors and modifications of engines for better operation, are saving autoists about \$100,000,000 a year and have made available 1,000,000,000 more gallons of auto

fuel from the same quantity of crude oil. It is predicted that Diesel auto motors will be developed in the next few years, suited for consuming crude oil and giving fifty miles to each nine-cent gallon. In addition, it is announced, half of the nation's bill for auto lubricating oil will be saved by the use of air cleaners, oil and crankcase ventilators.

Christian Science Monitor
2/21/27

REDUCE WEIGHT OF ARMY PACK AND RAISE DAILY RATIONS



Easing the Soldier's Burden; New Pack at Left Weighs Fifty-One Pounds; Old, at Right, Seventy-Nine

The weight of the pack carried by United States infantrymen was reduced to an average of fifty-one pounds by a recent war-department order. It is now the lightest pack in the world. At the same time, the daily allowance for rations per soldier was increased from a little more than thirty-six to fifty cents. This will give the soldiers nine ounces more of turkey on Thanksgiving day and Christmas per man, and will allow more coffee, sugar and milk on travel rations. The French infantryman's pack weighs sixty-four pounds; the German's, eighty-three; the Japanese, sixty-four; the Italian's, fifty-two, and Englishman's, fifty-five. In the new American pack, extra shoes and gloves are eliminated. The dough-box will carry sixty rounds of ammunition, a steel helmet, gas mask,

foot powder, condiment can, overcoat and reserve rations. The reduction is expected to strengthen the morale of the army.

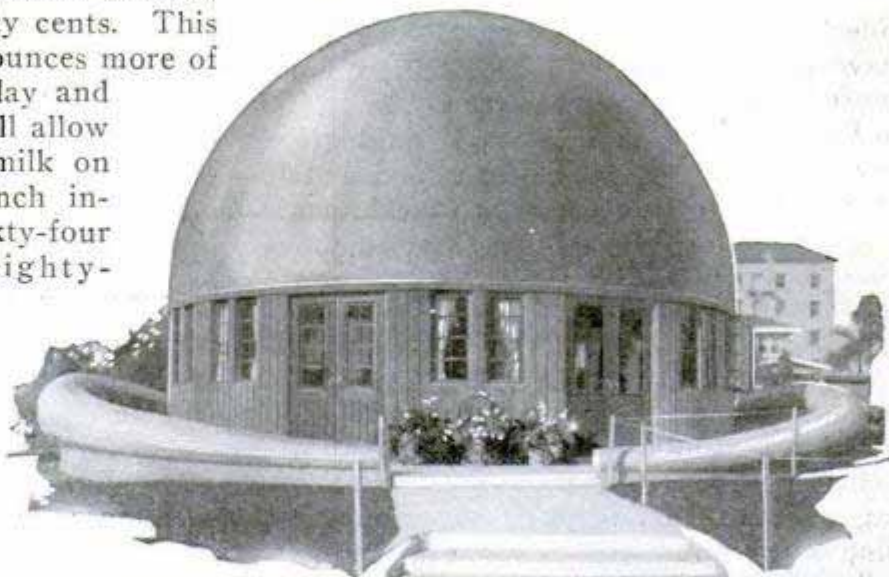
RADIO TO LINK OIL STATIONS IN TROPIC JUNGLE

For communication between oil-pumping stations in Colombia, South America, engineers are installing a radio-telephone system to replace the wire lines which frequently are thrown out of commission by falling trees during storms. Contact among the stations is necessary, for, if a valve at one pumping point is closed without informing the next station, a burst pipe and probably expensive delays will follow. To find out how much power would be required for operating the radio through the tangle of damp vegetation, numerous tests were made. A 500-watt transmitter was chosen to operate on a 100-meter wavelength, and the power plant was driven by a gasoline motor. There are nine stations in the chain, all about forty-five miles apart.

Oliver. Andean National Corp

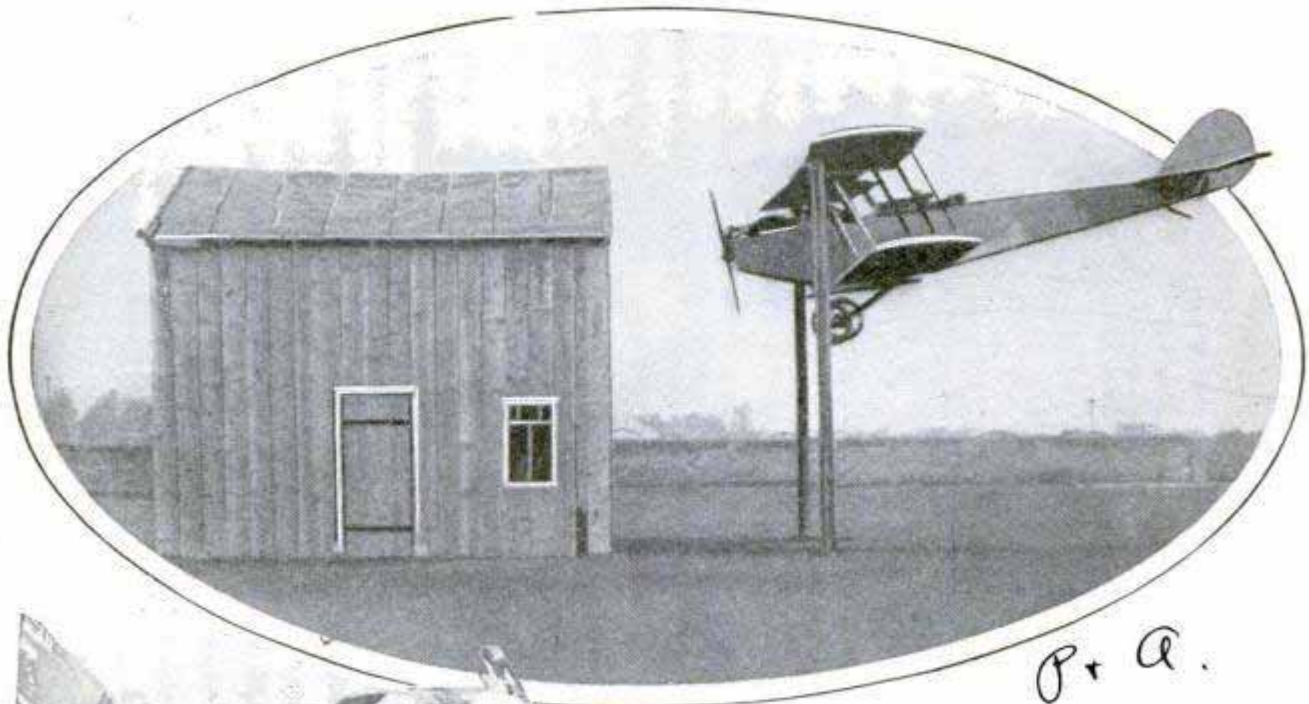
CAFE IN FORM OF DERBY HAT 1796 GETS ABUNDANT LIGHT

Resembling a derby hat, a cafe building in Los Angeles is conspicuous because of its novel shape. Besides the advertising value of the odd plan, the circular room has the advantage of a greater number of choice seats by the windows, and plenty of light from outdoors.



Where Customers Enter and Leave through the "Hatband"; Los Angeles Restaurant Modeled after the Renowned Brown Derby

1227



P. A.

The Plane before and after Striking the Shed, and Pilot, in Armor, as He Climbed Out of Wreckage

STUNT PILOT DRIVES AIRPLANE THROUGH HOUSE

Lives are risked almost daily to provide spectacular "shots" for motion pictures, a recent example being the intentional wreck of an airplane in collision with a dummy house. Finley Henderson, the pilot, glided down from a height of 1,000 feet, steered his ship between two "goal posts" on the Los Angeles polo grounds and into the cottage. The flimsy structure and the plane were a mass of wreckage an instant later, but, to the amazement of spectators, Henderson climbed out unharmed. Armor, in the shape of helmet, chest and body protectors, and puttees, had helped prevent injuries.

Victoria, England.

TIMBER SEASONED FIFTY YEARS CHOSEN FOR "OLD IRONSIDES"

Plans for the restoration of "Old Ironsides" include the use of oak timbers which have been submerged in fresh water for more than half a century. They were cut in Florida shortly after the Civil war, when the navy department purchased several large tracts of trees as a source of future shipbuilding material, since steel had not then come into general use. According to Lieut. John A. Lord, of the navy construction corps, the wood is now almost as hard as iron. About 500,000 board feet have been selected for the frigate. The masts will be of Douglas fir, and southern yellow pine has been chosen for the planking. Approximately sixty per cent of the ship will have to be restored. The work will start as soon as the \$500,000 public-subscription fund has been raised.

RUBBER CAPS ON AUTO LAMPS AID DRIVING IN FOG



One of the most recent aids to the motorist is a rubber cap of specially tinted rubber to be slipped over the headlights when driving through fog. The covering has the effect of diffusing the beam and the orange glow through the shield helps the vision.

Auto Sundries Ltd. 18/4. a Grosvenor Place London, S.W.

Christian Science Monitor
2/21/27

*Cryable Steel Co
of America
17 E. 42nd St
New York*

WORLD A BALL OF STAR DUST GEOLOGIST BELIEVES

1920

That the earth has been built up from a solid core of metallic and stony material by accumulations of star dust and was never in a molten condition, is the theory of Dr. Thomas C. Chamberlin, emeritus professor of geology at the University of Chicago. His conclusions are the result of more than twenty years devoted to the study of the mysteries concerning the formation of the oceans and the continents. In the very early history of the globe, after an atmosphere had been developed, Prof. Chamberlin holds, star dust fell more abundantly on moist regions than on dry areas, because the moisture added weight to the particles and brought them down more rapidly. The humid tracts, growing more quickly, developed into continents. Basins for the formation of bodies of water were developed by star dust that must have consisted of heavier particles which fell on the dry areas. The original core, about which the dust has accumulated, came from the sun, it is believed, being hurled off when a star approached sufficiently close to that body to cause an eruption on it. The whirling, projected bodies, turned on their own axes much in the same

mann^r as a shell from the rifling in a cannon, and the rotation added in scattering them about the sun like planets. One of the important points of Dr. Chamberlin's theory is that, if the world had been in a liquid state to begin with, it would not have developed the peculiarities it has today.

1921

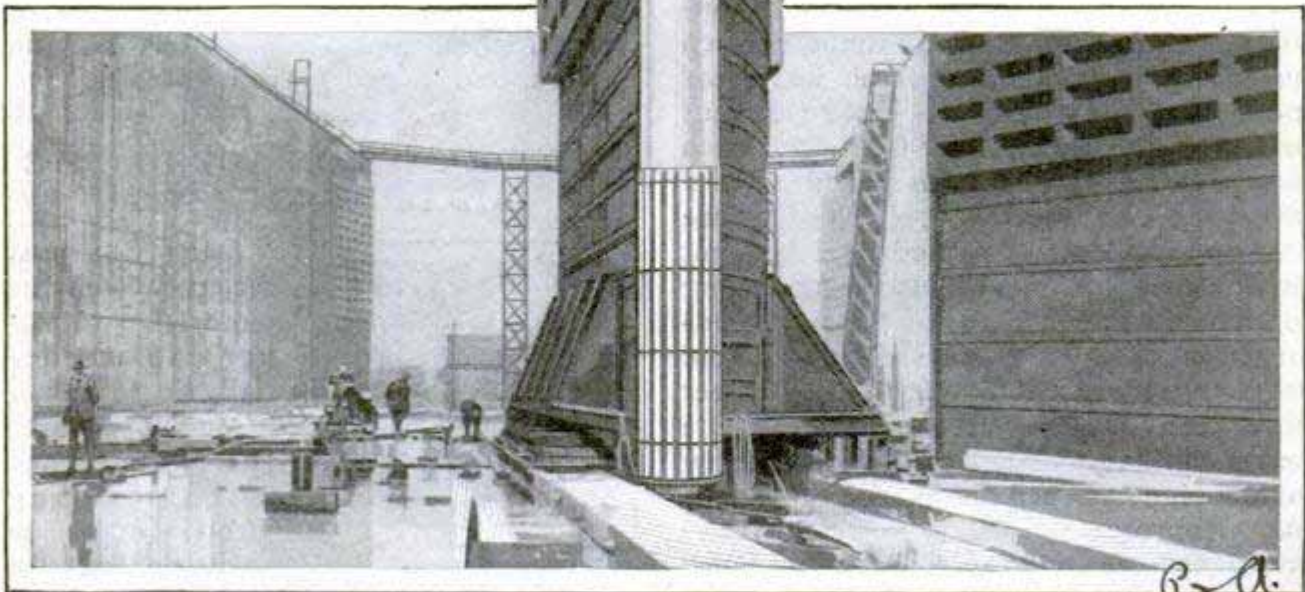
A NEW STEEL

Steel, from ten to fifty times as durable as the ordinary kind, has been prepared at an eastern plant, according to a recent announcement. It was made in laboratories several years ago, but, at that time, the necessary alloys for its manufacture could not easily be obtained. This handicap has now been entirely overcome and the strength of the steel has been tested by extensive experiments.

DOCK GATE LOOKS LIKE SKYSCRAPER

What are said to be the largest lock gates in the world have been constructed for the entrance to a new dock in Liverpool. A single leaf weighs 500 tons, and, as shown here, bears considerable resemblance to a skyscraper, such as the Flatiron building in New York city.

654 W Washington. Chicago



Mammoth Lock Gate, Weighing 500 Tons, Which Bears a Remarkable Resemblance to the Famous Old Flatiron Building in New York; Note Comparative Size of Workmen

Cambridge Mass
**LIFE OF COLLARS
 LENGTHENED
 BY STUDY** 1900

Largely due to improved methods in laundering, the life of the average collar has been increased from six to nine months and that of bed sheets from two to four years, according to Prof. Robert P. Russell of the Massachusetts Institute of Technology. Under his direction, a two years' research into the collar question has just been completed. Surprising differences were found in wear of the same materials on various individuals. For one man, the same make of collar survived only five launderings as compared with fifteen for the average. The greatest wear comes at the points where repeated bending causes the fabric to crack at the starch-stiffened fold. Repeated adjustments of the tie and pinching the ends of the collar together in front also increase the natural wear.

**CURE FOR CROSS-EYES IS FOUND
 IN EXERCISER** 1933

Training persons with cross-eyes to recover normal vision is the chief function of a projecting instrument which is reported to have been successful in eighty per cent of the cases undertaken for correction. An image is shown on a screen, and directed to fall first on the field of one eye and then on the other. Thus the subject learns to co-ordinate both eyes, it is said. The projector also develops a sense of perspective and depth.



Exerciser in Use on Patient, to Correct Cross-Eyes; It Is Reported to Have Been Successful in Many Cases

Myomulator
 Cameron's Surgical Specialty Co.
 666 W. Division



Adding Beauty to the Automobile-Service Station; Tiled Structure Recently Completed in Residence Section of Los Angeles

**TILED AUTO-SERVICE STATION
 MODELED AFTER MOSQUE**

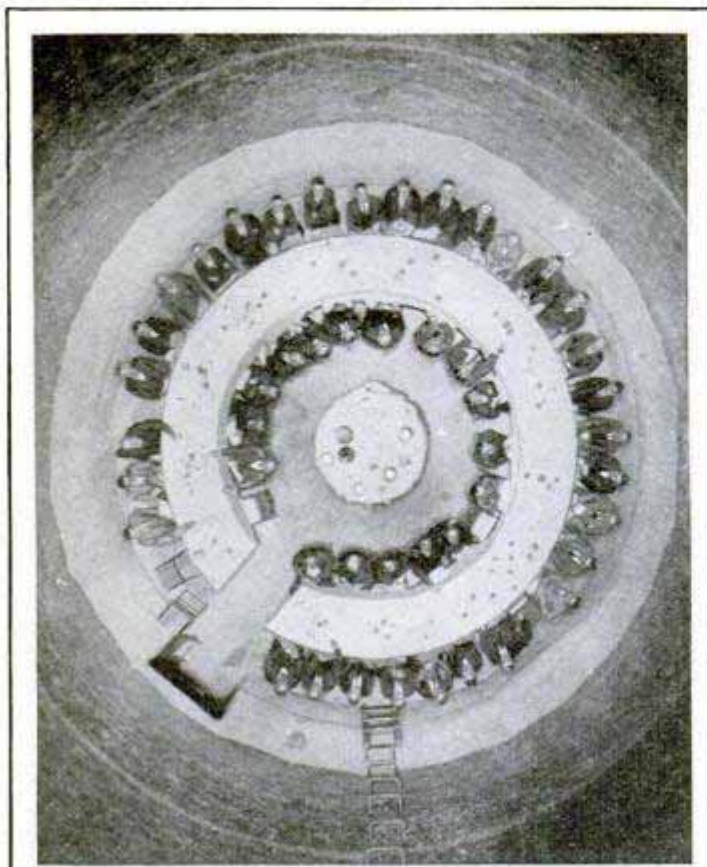
To harmonize with the character of the residential section in which it is located, an automobile-service station in Los Angeles is handsomely finished in colored tiles. The general plan is fashioned after a mosque with grilled gates and mosaic patterns in red, white and black.

**DINERS ICED BY ELECTRICITY
 TO CUT COST AND WASTE** 1937

Development of a system of electric refrigeration for dining cars has been announced by a western railroad. It is expected to result in economy of operation over the old icing method and to eliminate the likelihood of food spoiling, especially on long trips. The cars develop their own power for the freezing system.

C. M. Dr. P. A. R.

Copper Queen Branch, Phelps Dodge Corporation Plant



Looking Down on the Smokestack Diners; View inside the Huge Chimney While Banquet Was in Progress

SMOKESTACK AS BANQUET HALL SEATS FIFTY MEN

While smoke poured from the furnaces and into the smelter stack above them, fifty representatives of a Douglas, Ariz., copper company partook of a banquet at the base of the 350-foot chimney. Tables were arranged in circular fashion, to conform to the unique "room," while entrance and exit were gained through the huge vent at the bottom of the stack.

SPEEDING UP GROWTH OF TREES BY SOIL RESEARCH

Taller trees, more raw materials and new sources of fuel are promised to industry as a result of more intelligent study of the conditions under which plants thrive, according to Dr. J. S. McHargue, of the agricultural experiment station at Lexington, Ky. He points out that, until recent years, it was believed that only ten chemical elements were necessary for the normal growth of crops. It is now understood that at least eight more elements are essential. A most important part of the process is that, although some

of these substances are extremely important, administration of too large quantities proves disastrous to the plant. Among the additional elements required for many forms of plant life, besides the commoner ones, such as carbon, hydrogen and oxygen, are copper, zinc, boron, iodine and arsenic.

OCEAN TO SUPPLY NEW TINTS FOR AUTOMOBILES

Exploration of the ocean depths is next on the program of the manufacturer of colors, whose demands are growing since automobile owners began asking for "something distinctive." There are but 1,000 tints to choose from now, but the color hunters aren't satisfied, and before long, it is predicted, there will be a series of seaweed browns, coral pinks, Beardsley trout greens, etc. The bird kingdom has just been used up. "Birds gave most of the 1,000 tints," declared the head of a Detroit firm that makes colors exclusively for automobiles. "King Tut's tomb brought to light many new shades and the flowery kingdom, many others." Recently Henry Ford borrowed dozens of rare birds from the Smithsonian



In the Color Tester's Laboratory; Comparing Tint to That of Bird Plumage for Automobile Shades

institution and from them copied hundreds of new colors. Hunters waded through swamps and fought off insects and fevers in order to obtain the specimens which were used in a practical way for the first

Report to Engineering Foundation

Fisher Body Corporation

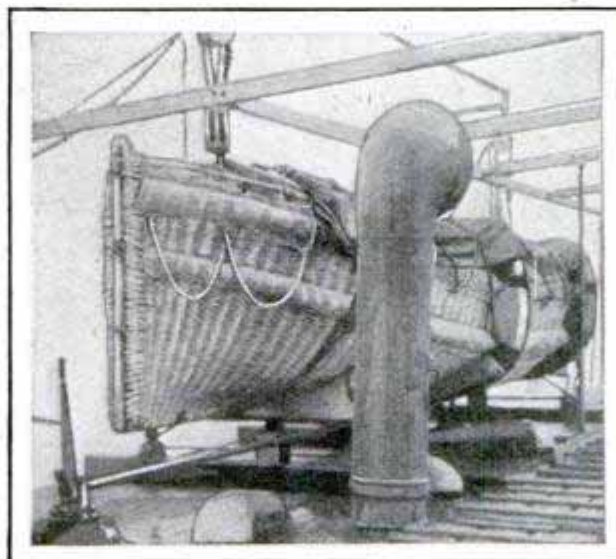
time when public demand wanted something different from the ordinary run of blues, pinks, grays, greens and yellows. Sea divers, say the paint and color manufacturers, may have other things to search for besides buried treasure, bullion from ancient Spanish galleons and lost gold pilfered from the Incas. They will be asked to dive deep among the sharks for nothing but a new shade of brown for milady's limousine.

SOUNDS THAT SOAR

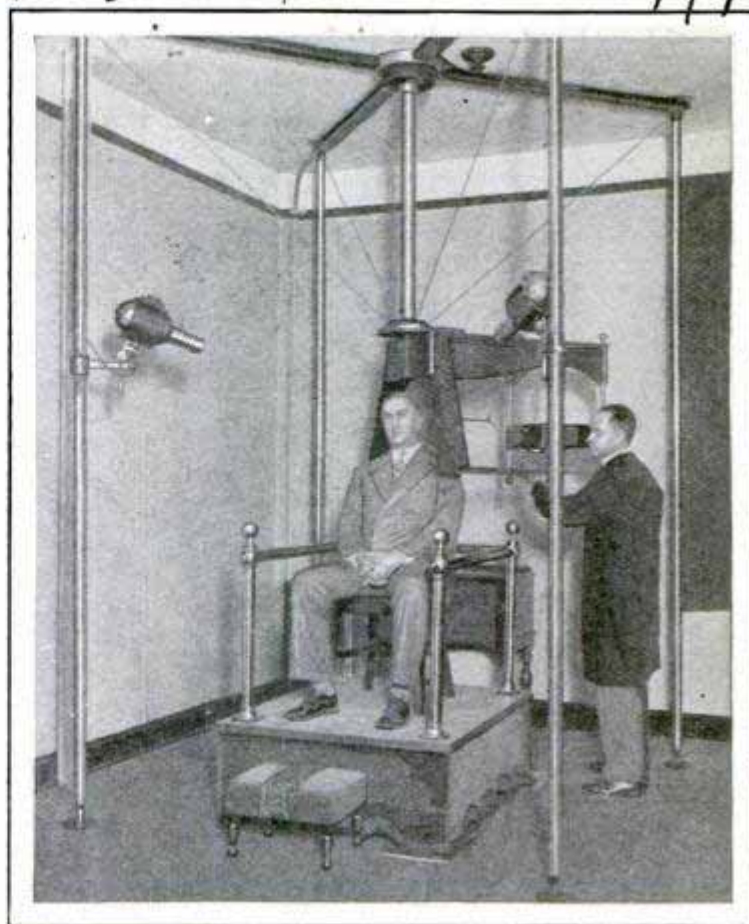
In connection with an investigation of city-traffic noises in London, interesting tests were made to determine how high some of the sounds are carried. The measurements were made from a balloon, as an airplane would have drowned out all other noises than that of its engine. Rumble of vehicles was heard as high as 2,500 feet, while the whistle of a locomotive was audible at an altitude of a mile and a half. A gunshot carried 5,400 feet high and music was distinguishable at a height of 4,200 feet. The investigators were surprised to discover that the croaking of frogs could be heard over half a mile above the ponds.

LIFEBOAT OF BASKET WORK GIVES GREATER SAFETY

Something new in lifeboats has appeared on the steamer "Callisto," of Rotterdam, in an ordinary craft covered with woven basket work and cork. This buoyant "armor" is said to afford greater ease in handling the boat and increased safety, as there is no danger of sinking and less likelihood of damage in case of a collision.



Basket Lifeboat on the "Callisto" of Rotterdam: Wicker and Cork Covering Increases Safety and Buoyancy



Mr. Engelmann at Right, Operating the Revolving Camera Which Takes 400 Pictures for Use in Sculpturing Portrait

MOVIE OF SCULPTOR'S MODEL SAVES TIME IN POSING

Not long ago, Popular Mechanics Magazine described the system developed by William F. Engelmann, a Chicago engineer and artist, for making portrait busts from motion-picture studies of the model. Here is the improved camera he has just

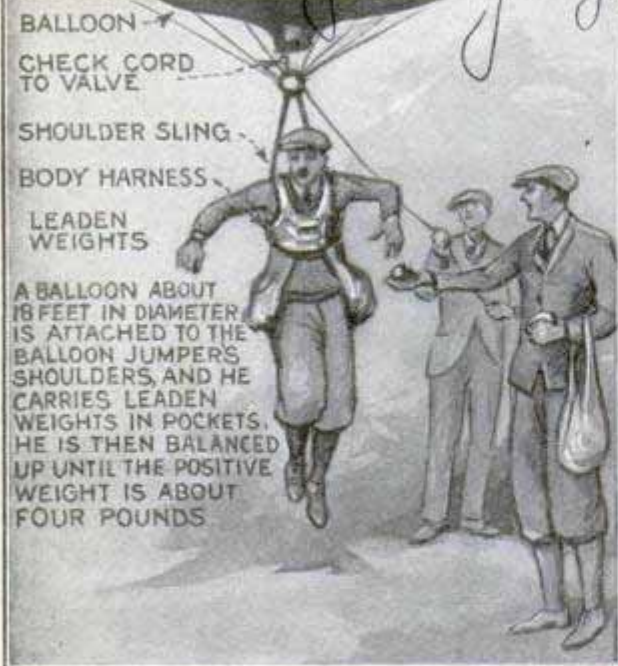
completed for this work. It is moved entirely around the subject, making 400 different pictures from as many angles. In less than half a minute, the entire series may be taken and the model dismissed. The photos serve as detailed guides for making the bust.

Radio waves pass around the earth seven and one-half times in a second.

and C. L. Parish
inventors, Wrigley
Cold...

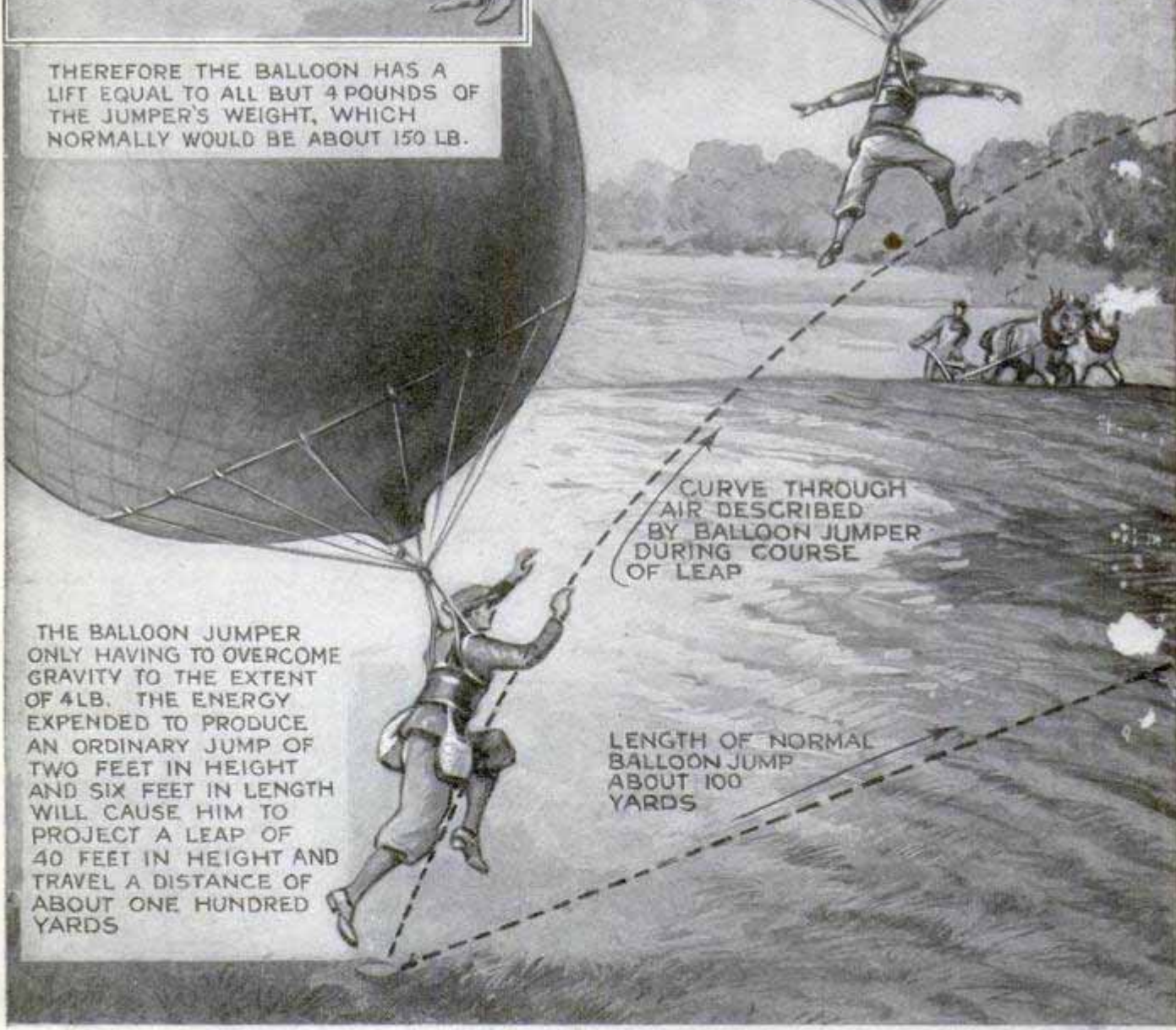
SEVEN-LEAGUE BOOTS OF THE BALLOON JUMPER

(Sole manufacturing rights and shop facilities.)



A BALLOON ABOUT 18 FEET IN DIAMETER IS ATTACHED TO THE BALLOON JUMPER'S SHOULDERS, AND HE CARRIES LEADEN WEIGHTS IN POCKETS. HE IS THEN BALANCED UP UNTIL THE POSITIVE WEIGHT IS ABOUT FOUR POUNDS.

THEREFORE THE BALLOON HAS A LIFT EQUAL TO ALL BUT 4 POUNDS OF THE JUMPER'S WEIGHT, WHICH NORMALLY WOULD BE ABOUT 150 LB.

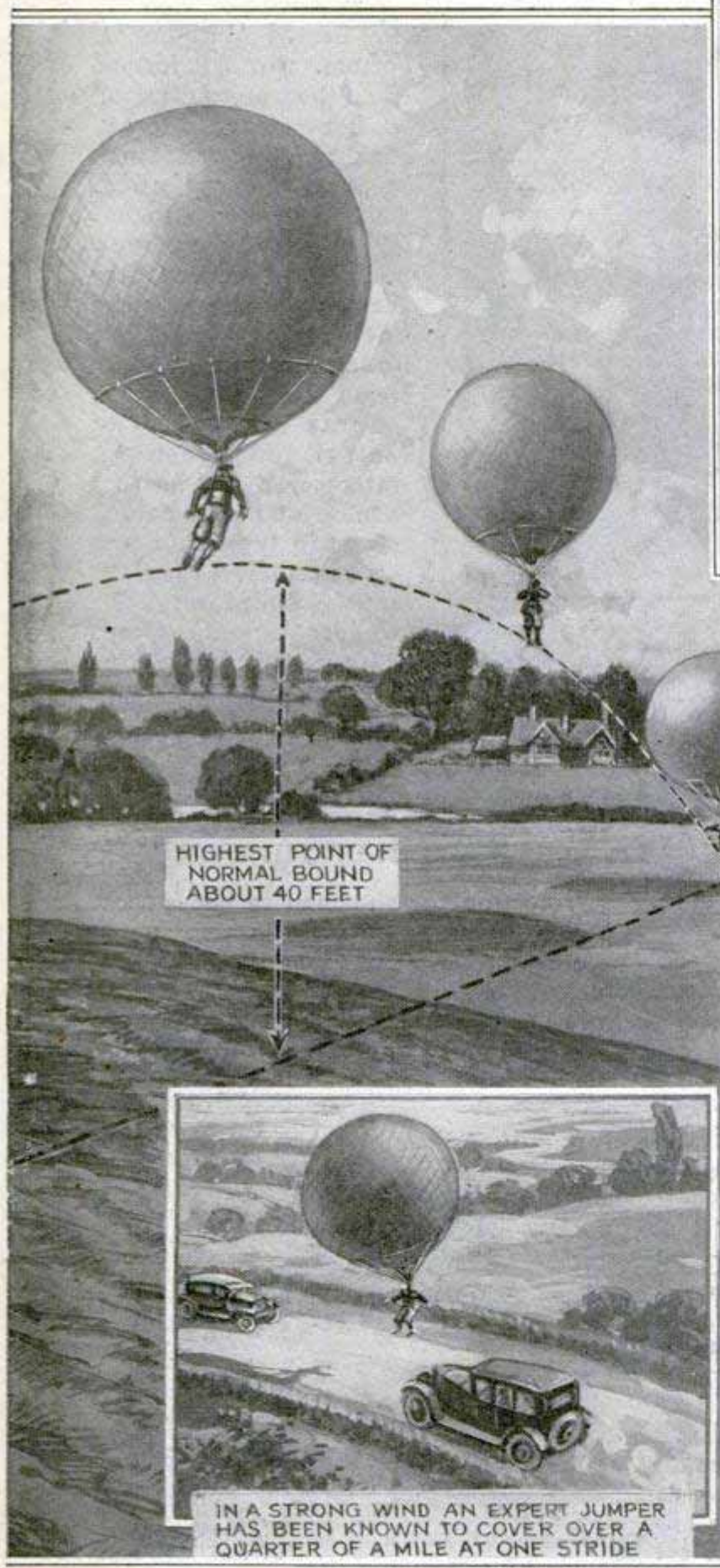


CURVE THROUGH AIR DESCRIBED BY BALLOON JUMPER DURING COURSE OF LEAP

LENGTH OF NORMAL BALLOON JUMP ABOUT 100 YARDS

THE BALLOON JUMPER ONLY HAVING TO OVERCOME GRAVITY TO THE EXTENT OF 4 LB. THE ENERGY EXPENDED TO PRODUCE AN ORDINARY JUMP OF TWO FEET IN HEIGHT AND SIX FEET IN LENGTH WILL CAUSE HIM TO PROJECT A LEAP OF 40 FEET IN HEIGHT AND TRAVEL A DISTANCE OF ABOUT ONE HUNDRED YARDS

A REMARKABLE NEW SPORT WITH MANY THRILLS



THE NEW SPORT
DEFLATED, THE BALLOON JUMPER'S
COMPLETE OUTFIT CAN BE PACKED
IN A FAIR-SIZED SUITCASE AND
SHOULDER HARNESS AND WEIGHTS
IN SMALL HAVERSACKS





Skyscraper Dedicated to the Care of the Sick; Huge Hospital in New York City Has Room for Hundreds of Patients

TWENTY-TWO-STORY HOSPITAL OCCUPIES TWO BLOCKS

One of the most interesting adaptations of the skyscraper style of building to a hospital is seen in the twenty-two-story structure overlooking the Hudson river in New York city. It covers two square blocks, and a special feature is the interior arrangement. Each floor is so equipped that it is practically an independent hospital in itself. The building is the realization of the dream of the founders of the Presbyterian hospital fifty-four years ago, and is scheduled for completion early next year. The hospital will be one of the largest in the world and will receive needy patients, irrespective of race and creed.

MAKING OLD OIL WELLS SPOUT WITH STEAM TREATMENT

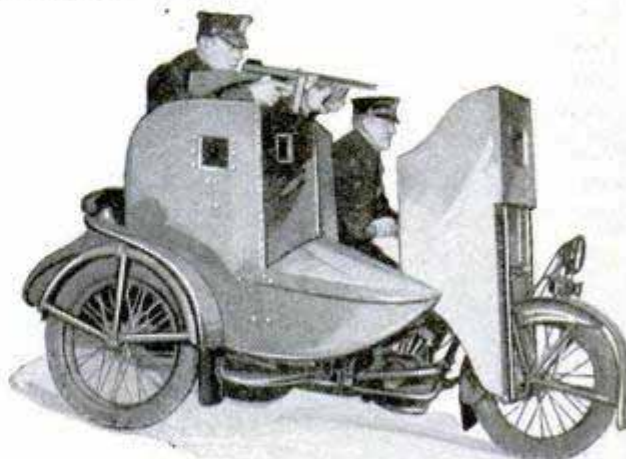
1859 Giving oil wells a steam bath to remove the clogging paraffin and cause them to flow again is now done more effectively with an apparatus devised by a New York engineer. It is said to overcome certain difficulties experienced in the process as previously applied, which injured the oil-bearing sands and caused the wax to set harder than it was before. The new instrument consists chiefly of a metal tube

with a water cylinder at top and space for iron billets, heated white-hot, at bottom. Steam is formed when the water falls upon the hot iron and is forced out through rows of small holes in the cylinder. This is lowered into hot water which has been poured into the well after the tubing and rods have been removed and the bore emptied. The steam not only melts the wax on the sides of the well but keeps the water below hot so that paraffin that runs into it is kept in suspension and can be removed when the water is bailed out. The cylinder is said to generate steam for about

three-quarters of an hour and from five to eight hours' treatment is sufficient to remove the paraffin.

MOTORCYCLE "FORT" FOR POLICE TO AID IN CRIME WAR

Protection for the man in the sidecar and the driver is afforded in an armored motorcycle designed especially for police duty. The shields are separate units and are so arranged that the occupants of the vehicle can use either their ordinary equipment of arms or light machine guns which have become almost necessary for police duty at the present time.

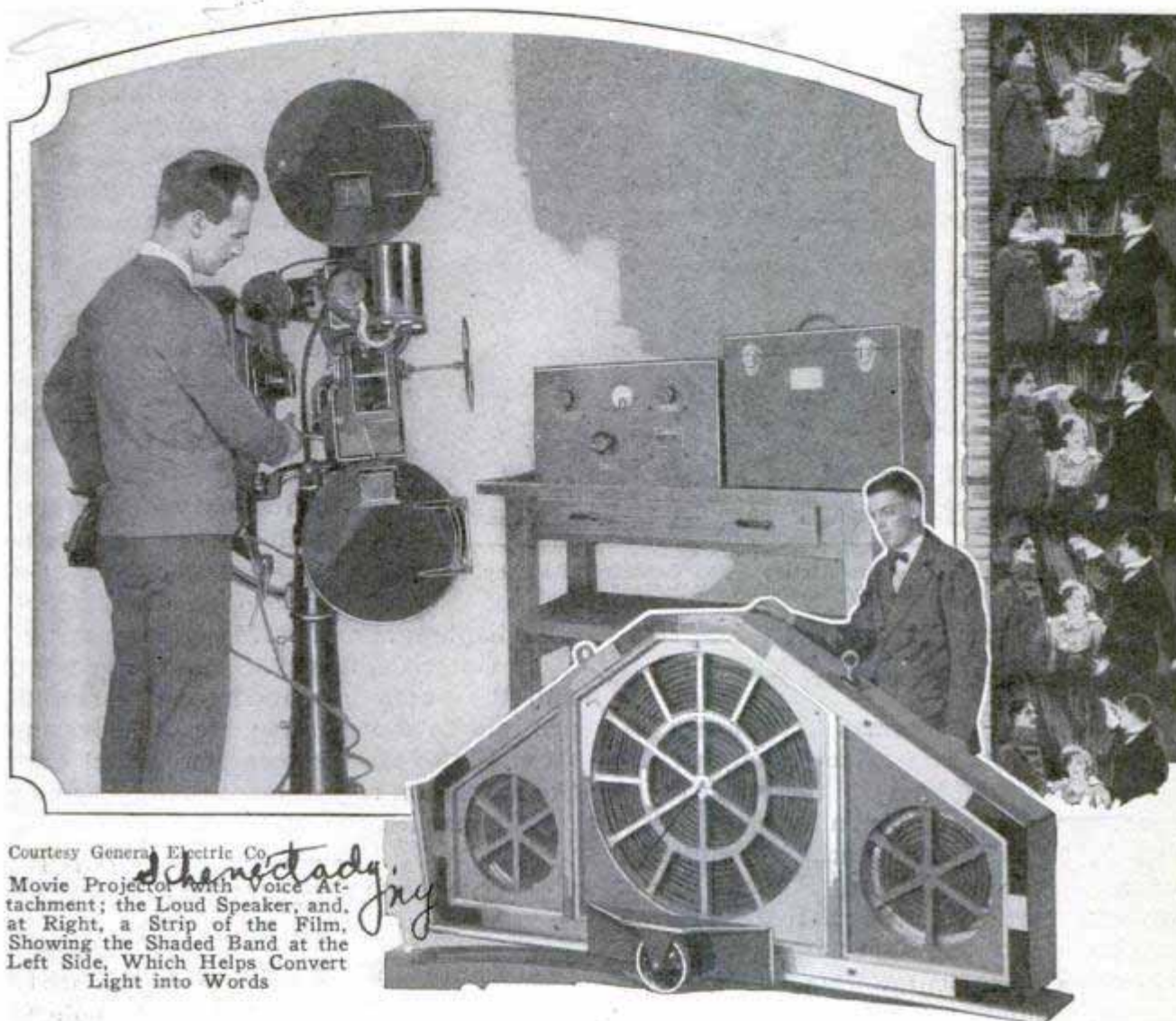


Traveling "Fort" for Policemen; the Armored Motorcycle and Sidecar with Support for Machine Gun

*Com. Edwin J. Arisse
The Starvation Station*

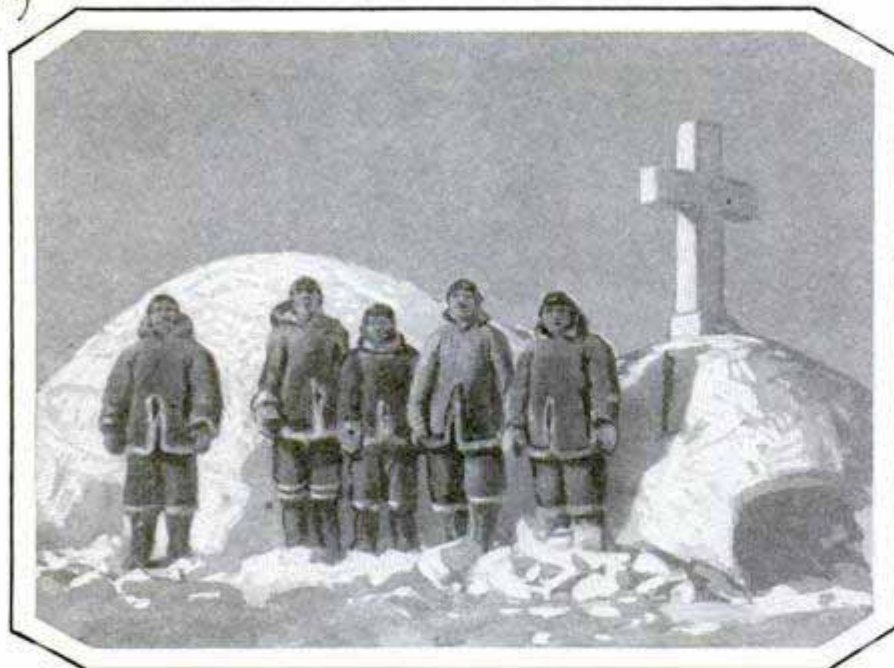
Journal Madison Square Garden

TALKING MOVIES PHOTOGRAPH VOICE ON THE FILM



Talking movies, in which the sound is photographed as a series of shadow bands along one edge of the moving-picture film, have been developed in the General Electric laboratories by a process whereby either the players' spoken parts or an orchestral accompaniment can be added, if desired, to any film at any time after it is made. The picture film itself is taken in the usual way. After it has been cut and titled, it is run off and the accompaniment played to fit it is photographed on another film. The negative of the pictures and the negative of the sound are then printed together on a single positive. The finished picture is little different from any standard movie film, even being the standard width, so that it can be run through any existing projector. The only change is the addition of an optical system that picks up the light passing through the shadow bands and focuses it

on a photoelectric cell, instead of letting it pass on to the screen, as does the rest of the picture. The varying degrees of black and white in the shadow bands set up corresponding variations in the current passing through the photoelectric cell, and this current in turn is amplified by radio apparatus and released as sound from a loud speaker hidden above the screen on the stage. The photographing of both picture and sound on the same film removes all difficulties in keeping the two synchronized—one cannot run faster than the other—and if the film breaks, the music stops, so that one can't run on when the other has ceased. With the new device, neighborhood picture houses, accustomed to having only an organ or piano for musical accompaniment, will be able to present feature pictures with the full symphony-orchestra accompaniment heard in the larger cities.



When Christmas Comes to the Arctic; Igloo Cathedral Built by Eskimos during Holiday Celebration on Baffin Land

SNOW CATHEDRAL IN ARCTIC — BUILT BY ESKIMOS

Along about Christmas time many Eskimos congregate at Lake Amadjuak, on Baffin land, and one of the features of their holiday last season was an igloo church, a real Arctic cathedral built of ice and snow. William Thomas Lapp, former superintendent of native education in Alaska and also supervisor of the native reindeer industry, who led the Eskimos in community singing, reports that they enjoyed it so much that they were unwilling to break up their gatherings even for meals.

ELECTRIC FIRE-ALARM SIGNAL PROTECTS LIVES AND HOMES

For easy installation in homes and other buildings, an electric fire-alarm system, patented by a Canadian inventor, consists chiefly of a fuse box in which cocoa butter melts at ninety-four degrees Fahrenheit, completing a circuit to ring a gong. The apparatus may be connected to a private bell in the building or to a fire station for unoccupied houses.

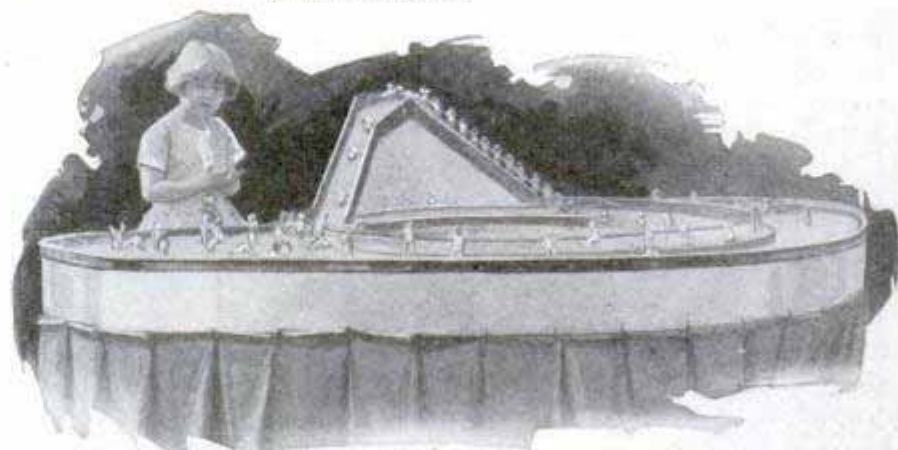
AUTO FUEL SYSTEM TO REDUCE WASTE

Feeding the automobile engine strictly in proportion to its requirements and straining the gasoline before it reaches the carburetor, are functions of a new mechanical fuel-supply device. It is designed to be attached to the motor and operated by a lever driven from the cam shaft. It is about five inches high and four inches wide, and consists principally of a pump which sucks fuel from the tank at the rear of the car through the strainer.

The diaphragm and valves are of non-metallic materials, that will stand long wear, and the pump has undergone tests that are said to prove it capable of delivering from 100 to 200 per cent more fuel than the maximum requirement of any car now on the market.

MODEL OF SWIMMING CHUTE HAS DOLL BATHERS

Dolls are utilized for a serious purpose in demonstrating a swimming chute which a Los Angeles inventor has devised. An objection to such rigs is that there is usually some danger of injury at the bottom of the slide. The inventor's model, with its toy bathers, shows that a current of water takes the doll clear of the end of the chute.



Demonstrating the Swimming-Chute Model with Doll Bathers; a Current of Water Prevents Injury at Bottom of Slide

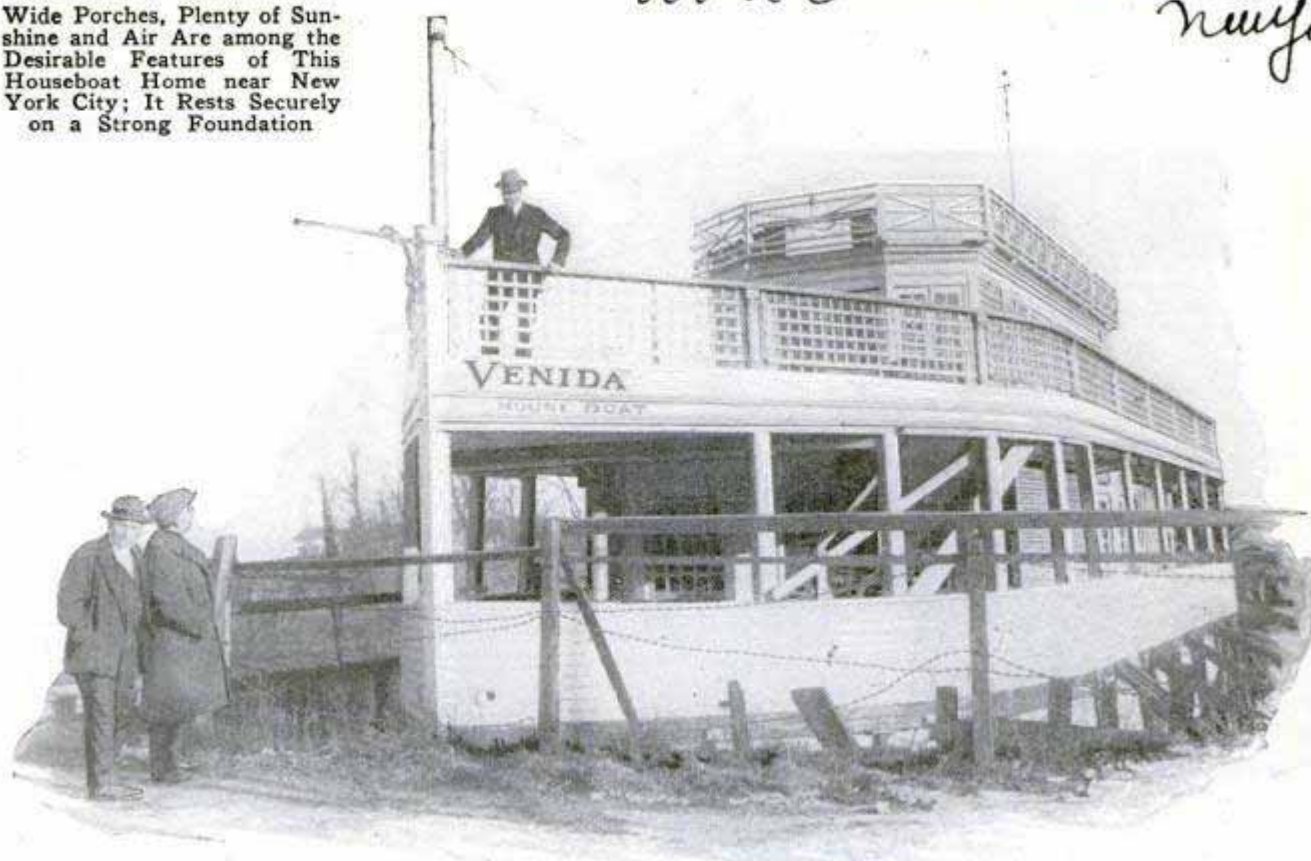
Chas M. D. Wheeler
Los Angeles, Calif

Patd Canada
U.S. pend

Mr. J. McT. Smith, Box 935, N.B. Canada
Jan 10 1935

A.C. Spark Plug Co. Fr. Lumb. Mich.

Wide Porches, Plenty of Sunshine and Air Are among the Desirable Features of This Houseboat Home near New York City; It Rests Securely on a Strong Foundation.



BOATS FITTED AS HOUSES CUT HIGH COST OF LIVING

Four rooms, bath and sun parlor are provided in comfortable houseboats along the Bronx river, near New York city. They rent for a few dollars weekly.

THIRTY USES FOR FLAX FIBER NOW GOING TO WASTE

Millions of tons of flax straw now wasted on American farms could be utilized as raw material to supply a number of potential industries which have been suggested by the development of new uses for flax, according to investigators for the department of agriculture. A survey shows that ~~the flax straw already~~ is being used to a limited extent in the manufacture of commodities ranging from celluloid to fish nets, but only a small part of the total produced is so utilized. The fiber is adapted to the making of artificial silk, binding twine, insulating materials for ice boxes, fiberboard, automobile fabrics, paper, rope and rugs. Short waste flax fibers have been employed in certain kinds of plaster and as a binder in boiler-covering compositions. Soft, twisted flax yarns are useful to the plumber in packing the joints of

water mains. Flax is now grown in the United States principally for the seed, from which is produced an oil used in the making of paints, linoleums, soap, imitation leather, inks and medicines. Between 1913 and 1922, the average annual production of flaxseed in the United States was 11,890,000 bushels, less than half of the average yearly net consumption for the period. The bureau of agricultural economics recently has prepared a bulletin concerning the yields, prices, marketing methods and other facts concerning flax and its by-products.

STRETCHLESS THREE-PLY BELT UTILIZES OLD LEATHER

For a wide variety of pulley drives, a belt is made in three layers, a strong fabric being introduced between one ply of old leather and one of new. It is said to be more flexible than solid-leather belting, while the center ply prevents stretching and shrinking.



Peerless Belting Co.,
Inc.
New York

374

New York, New York
480 Lexington Ave
New York

Seeing Europe

AN American tourist crossed the ocean last summer to see Europe from the air. He saw it, from Moscow on the north to the tip of Spain at Gibraltar, and from England on the west to Bucharest on the east, and in addition found time for side trips in Asia and Africa. The log of his journey shows he covered 19,726 miles and saved twenty-nine days and eight hours over the schedule railroad time by using airplanes. His actual flying time was not more than 234 hours and forty-nine minutes.

Nothing that has been said about the marvelous growth of commercial aviation abroad gives a better picture of the extent of air travel there as compared with passenger flying in this country.

The traveler by air in Europe misses the annoying broken journeys such as that by train, boat and train from London to Paris, the rough water of the English channel and the frequent passport and

custom examinations. Then, too, the air lines reach out into regions where train service is slow and poor, and save hours and days of wasted time. The train journey from Berlin to Moscow takes fifty-four hours, if the train is on time. The air trip for the 1,142 miles takes eleven hours and thirty-eight minutes, including time lost in two stops.

To go to Paris from London means an entire day wasted, or, if the trip is made at night, it requires loss of sleep making the change from train to channel steamer and back to train on the seven-hour journey, while the big, three-engined, fourteen-passenger planes make the 235-



Courtesy Aviation

Preparing to Leave Le Bourget Field, at Paris, in a Three-Engine French Plane, Bound for London; the Passengers Pause to Patronize the Cigaret and Candy Boy

from an Air Liner



Courtesy Aviation

A Pair of Luft Hansa Monoplanes before the Hangars at Templehofer Field, Berlin, Waiting to Start the Night Flight to Koenigsberg, the First Step in the Journey to Moscow

mile jump in about two and a half hours. The booking for passage on an air liner is not much different from arranging for a train journey. Downtown ticket offices supply transportation; in the case of the London-Paris trip the ticket is a small booklet containing a series of coupons. The first entitles the bearer to ride from his hotel out to Croydon airdrome, in a suburb. The next is the aerial ticket, and a third is for the bus trip from the flying field, in a Paris suburb, into the city.

Arrived at Croydon, the first step is to be weighed in, the passenger on one scale and his baggage on another. Thirty pounds of baggage is carried free, and the excess is charged for. There is no limit on the weight of a passenger, but the weighing is necessary in order that the combined weights of passengers, crew and baggage may be kept within the lifting limit of the plane. From the weighing room the passengers pass through the custom shed where passports are examined and baggage searched for contraband.

While the passengers are going through these formalities, the ground crew rolls out the craft, a three-motored Handley-Page if an English ship is due to depart, or a two-engined Farman-Goliath, if it belongs to the French air union, which divides the traffic with the British com-

pany. The engines are warmed up while the flying field "red caps" wheel out the baggage and stow it in place.

The pilot consults the weather map, which shows hourly wireless reports on the weather at a dozen fields along his route. By the time the passengers are in their seats, he is ready to taxi out to the runway and turn to face the big liner into the wind for the take-off. The plane dispatcher, from his observation tower, makes sure that no arriving ships are in the way and gives the signal for the start.

The airplane dispatcher's office keeps in constant radio touch with every ship in the air not only on the Paris route, but also on the lines which radiate north-eastward to Ostend, Belgium, and Amsterdam, Holland, where they link with several German lines covering those countries, Germany, Denmark and reaching up into Sweden. On his map, which corresponds to a train dispatcher's sheet, he follows their movements from start to finish of each trip.

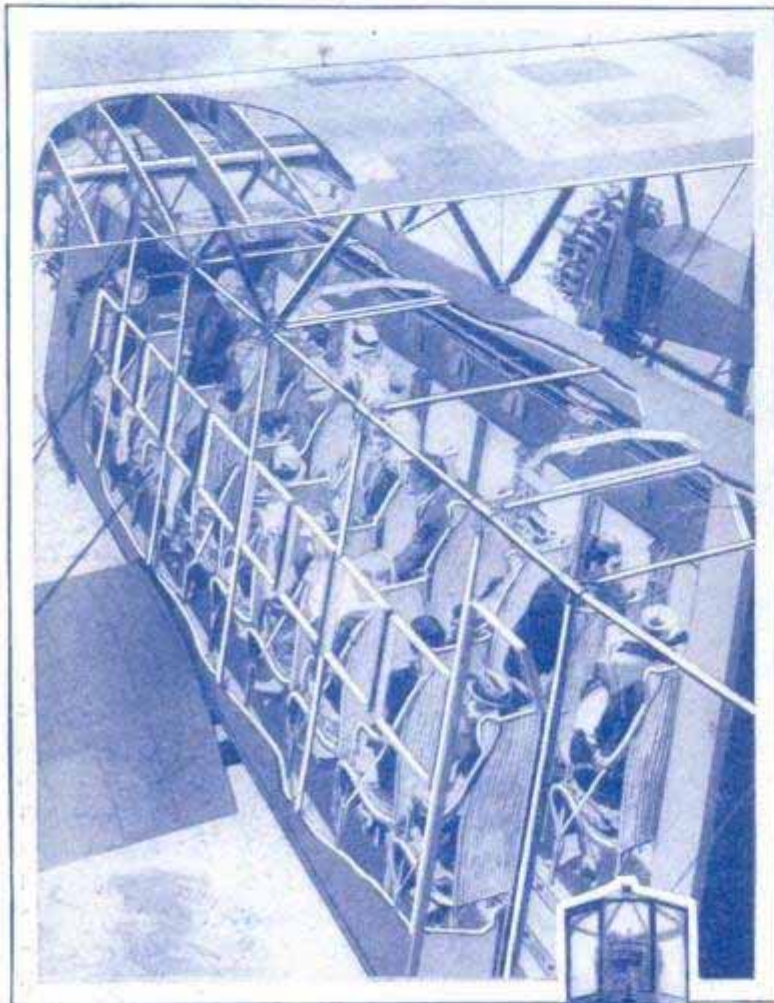
Storms over the English channel, accompanied by fog, are quite common. When they occur, the planes call frequently for bearings by wireless. Then Croydon and the government radio station at Pulham, far up on the east coast, take the bearings from which the signals

come. Pulham radios the compass reading to Croydon, the two bearings are plotted on the map, and the point where they intersect, which is the point from which the plane sent its call, is radioed

sels and the northern air routes; or take a south-bound ship that will land them at Lyons, or go on from there to Marseilles. From the latter port, on the Mediterranean, there are air lines skirting the sea down the east coast of Spain to Gibraltar, and across to northern Africa.

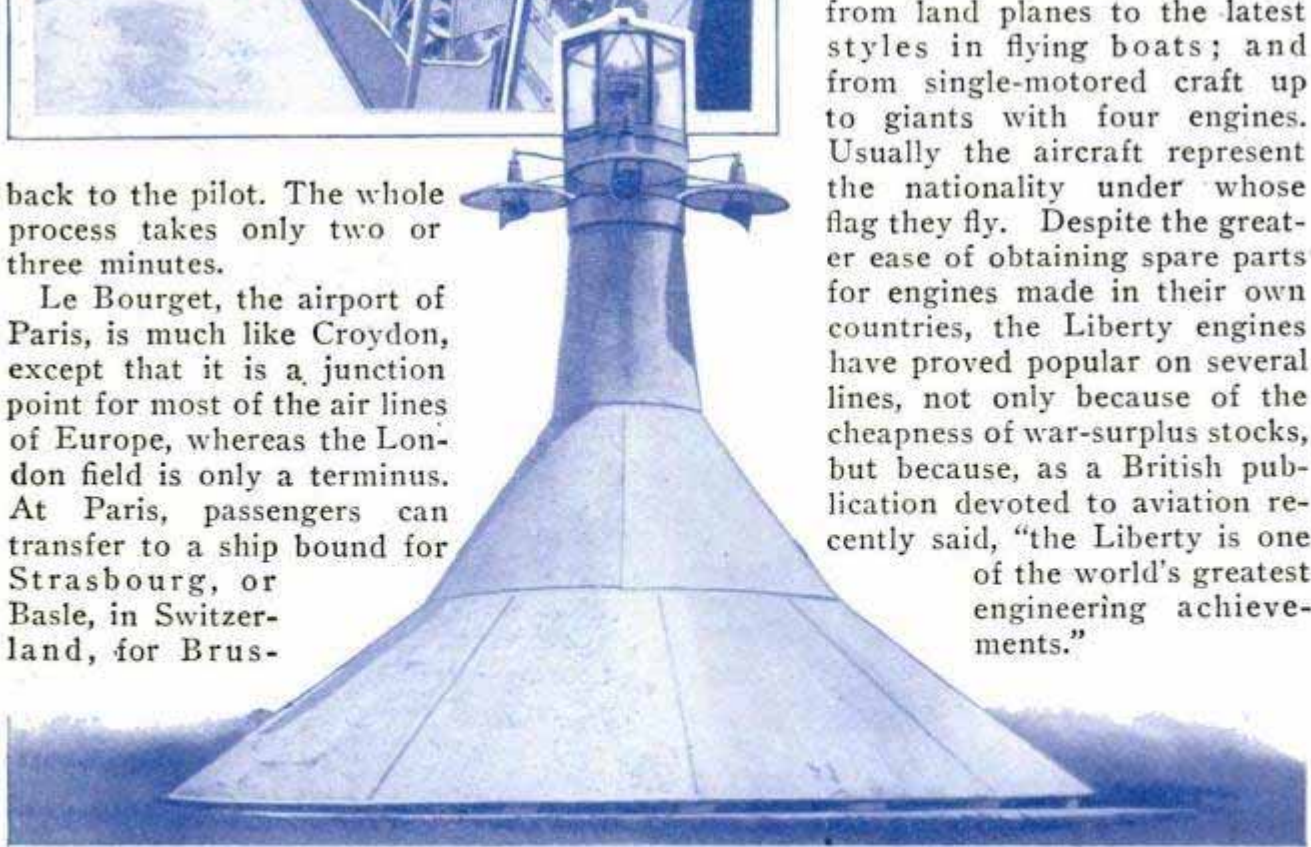
The traveler bound to India or Australia can cut a week off his journey by hopping south by air and joining a steamer far down on the Indian ocean, at the mouth of the Red sea. Or, from Brussels, Belgians bound to their possessions in the Congo can go by way of Constantinople and the British lines in Africa to Katanga, where connections are made with a new Belgian air line to Leopoldville, in the heart of darkest Africa. In three days the traveler can span the distance from Belgium to the Congo, whereas it takes forty-five days by other means.

The equipment on the European air trails is of all kinds, fabric planes to all-metal ships, from land planes to the latest styles in flying boats; and from single-motored craft up to giants with four engines. Usually the aircraft represent the nationality under whose flag they fly. Despite the greater ease of obtaining spare parts for engines made in their own countries, the Liberty engines have proved popular on several lines, not only because of the cheapness of war-surplus stocks, but because, as a British publication devoted to aviation recently said, "the Liberty is one of the world's greatest engineering achievements."

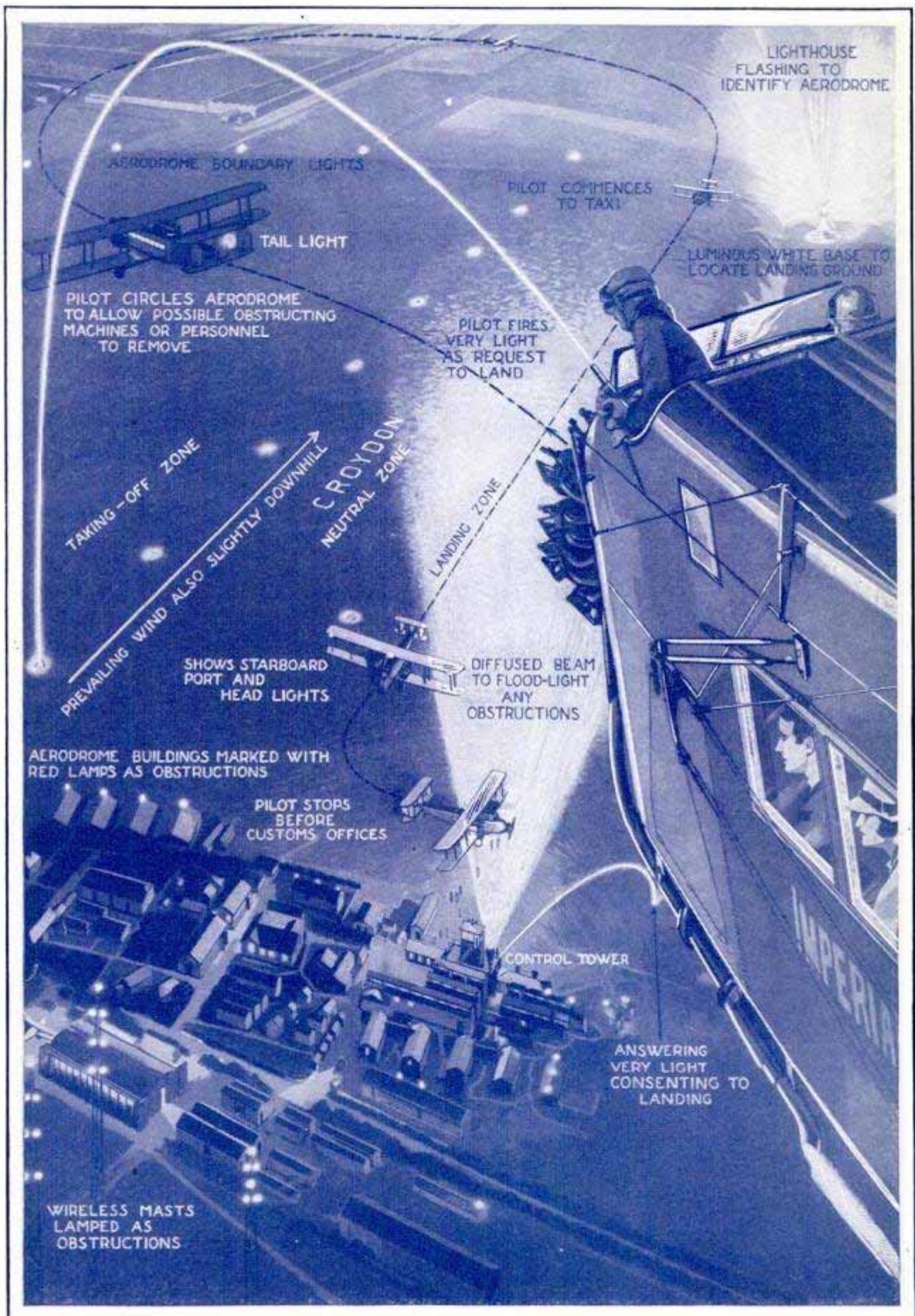


back to the pilot. The whole process takes only two or three minutes.

Le Bourget, the airport of Paris, is much like Croydon, except that it is a junction point for most of the air lines of Europe, whereas the London field is only a terminus. At Paris, passengers can transfer to a ship bound for Strasbourg, or Basle, in Switzerland, for Brus-



Cut-Away Sketch Showing the Seating Arrangements in the Giant Cross-Eurone Air Liners, and, Below, the Pyramid Light Whose Flashing Beacon Marks Croydon, London's Airport



Copyright, S. W. Clatsworthy

Artist's Diagram of the Successive Steps When a Giant Cross-Channel Air Liner Arrives and Lands at Croydon, the London Flying Field, in One of the City's Southern Suburbs

DESIGNS FOR EVERY NEW TYPE COMMERCIAL PLANE ARE CAREFULLY TESTED BY GOVERNMENT ENGINEERS TO CALCULATE THE SAFETY FACTOR AND FIX AN APPROVED MAXIMUM LOAD



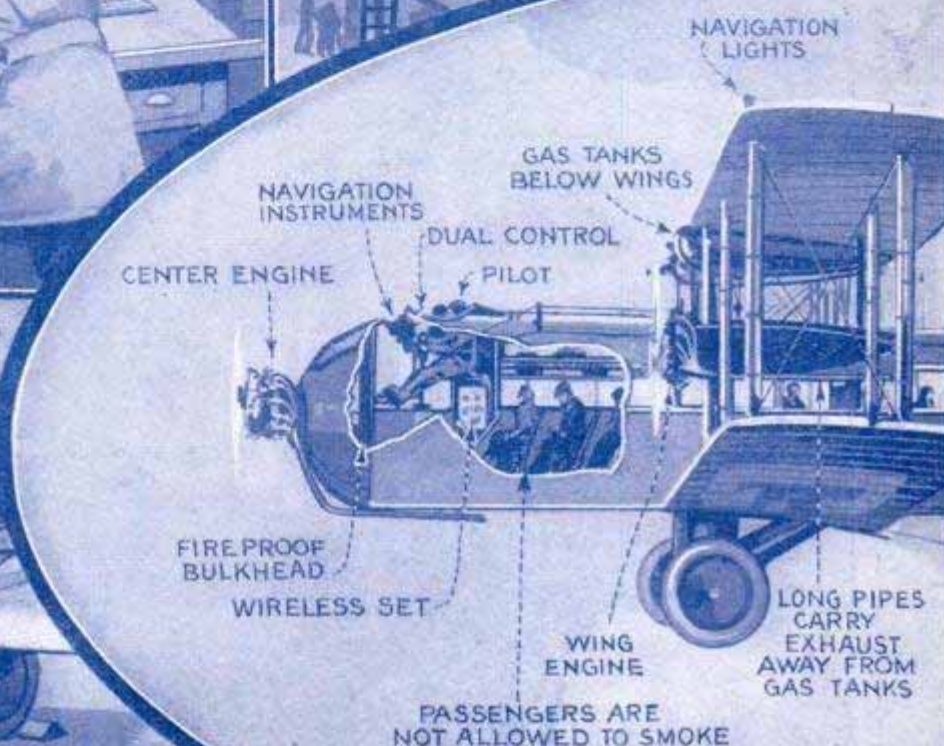
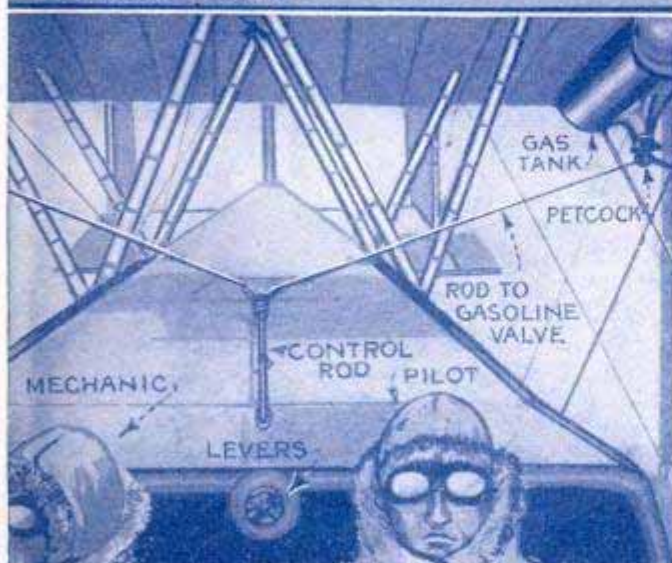
GOVERNMENT INSPECTORS TEST EVERY PART DURING CONSTRUCTION AND AGAIN BEFORE THE FIRST TEST FLIGHTS ARE MADE



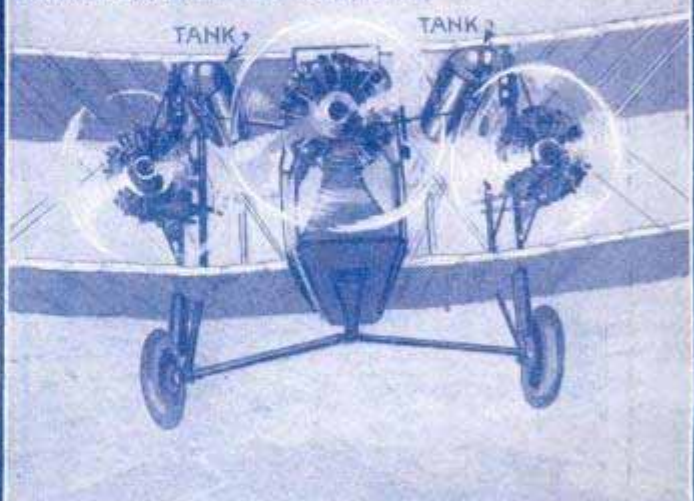
EACH PASSENGER CARRYING MACHINE IN SERVICE IS INSPECTED DAILY BY LICENSED GROUND ENGINEERS TO INSURE IT IS SAFE



ALL GASOLINE TANK VALVES MUST BE CONTROLLED FROM THE PILOT'S SEAT IN PASSENGER PLANES



GAS TANKS ON WINGS ARE CLEAR OF FIRE DANGER, WHILE THE LEAKAGE IS BLOWN AWAY BY THE BLAST DRIVEN BACK BY THE PROPELLER



Passenger Air Traffic on the Highly Developed Routes Abroad Is Made Safe by Rigid Supervision from the Time the Airplane Is Planned on Paper through All Its Flying Life

WHEN COMPLETED AND APPROVED THE MACHINE MUST PASS ITS OFFICIAL TEST TRIALS UNDER ALL FLYING CONDITIONS



THE FLYING ENGINEER MAKES FREQUENT INSPECTIONS IN THE CABIN TO ENFORCE THE RULE AGAINST SMOKING WHILE IN THE AIR



SAFETY MEASURES ENFORCED BY GOVERNMENT CONTROL OF PASSENGER PLANES

ESCAPE PANEL IN ROOF OF CABIN AS EXIT IN EMERGENCY

BODY COVERED WITH NON-INFLAMMABLE MATERIAL

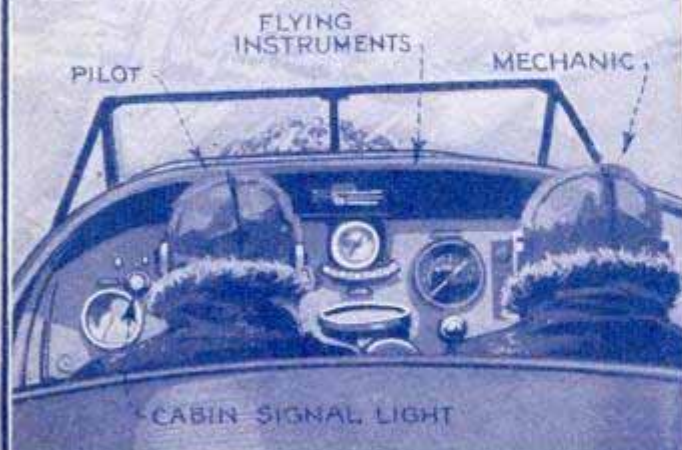


ENGINE EXHAUST PIPES ARE CARRIED CLEAR OF THE ENGINE AND BACK BEYOND DANGER ZONE

CONTROL WIRES IN DUPLICATE

WIRELESS AERIAL

SIGNAL LIGHT FROM CABIN PERMITS PASSENGERS TO ATTRACT PILOT'S ATTENTION IF ANYTHING GOES WRONG IN THEIR COMPARTMENT

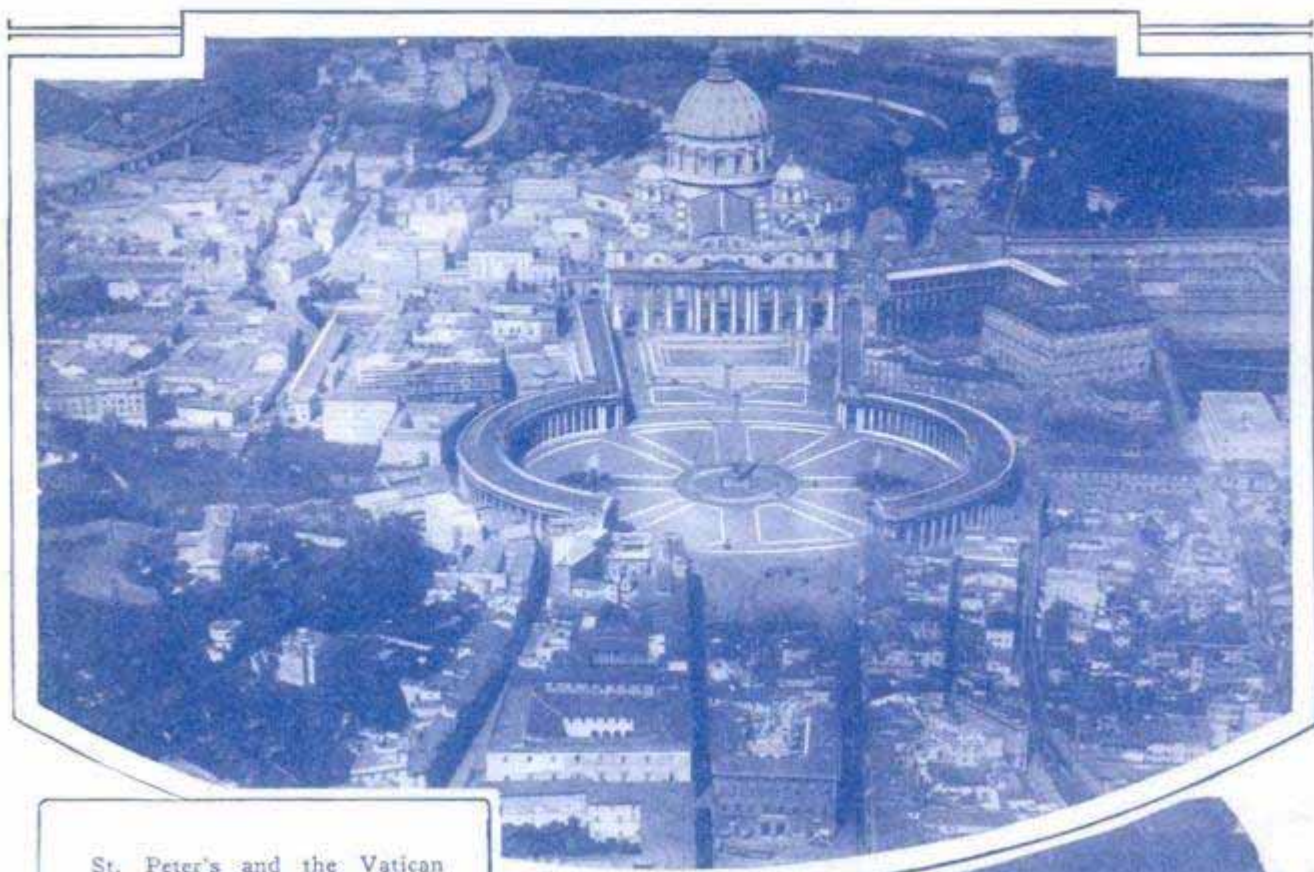


PILOTS MUST PASS STRINGENT MEDICAL TESTS EVERY SIX MONTHS AND SPECIAL EXAMS BEFORE FLYING NEW TYPE SHIPS

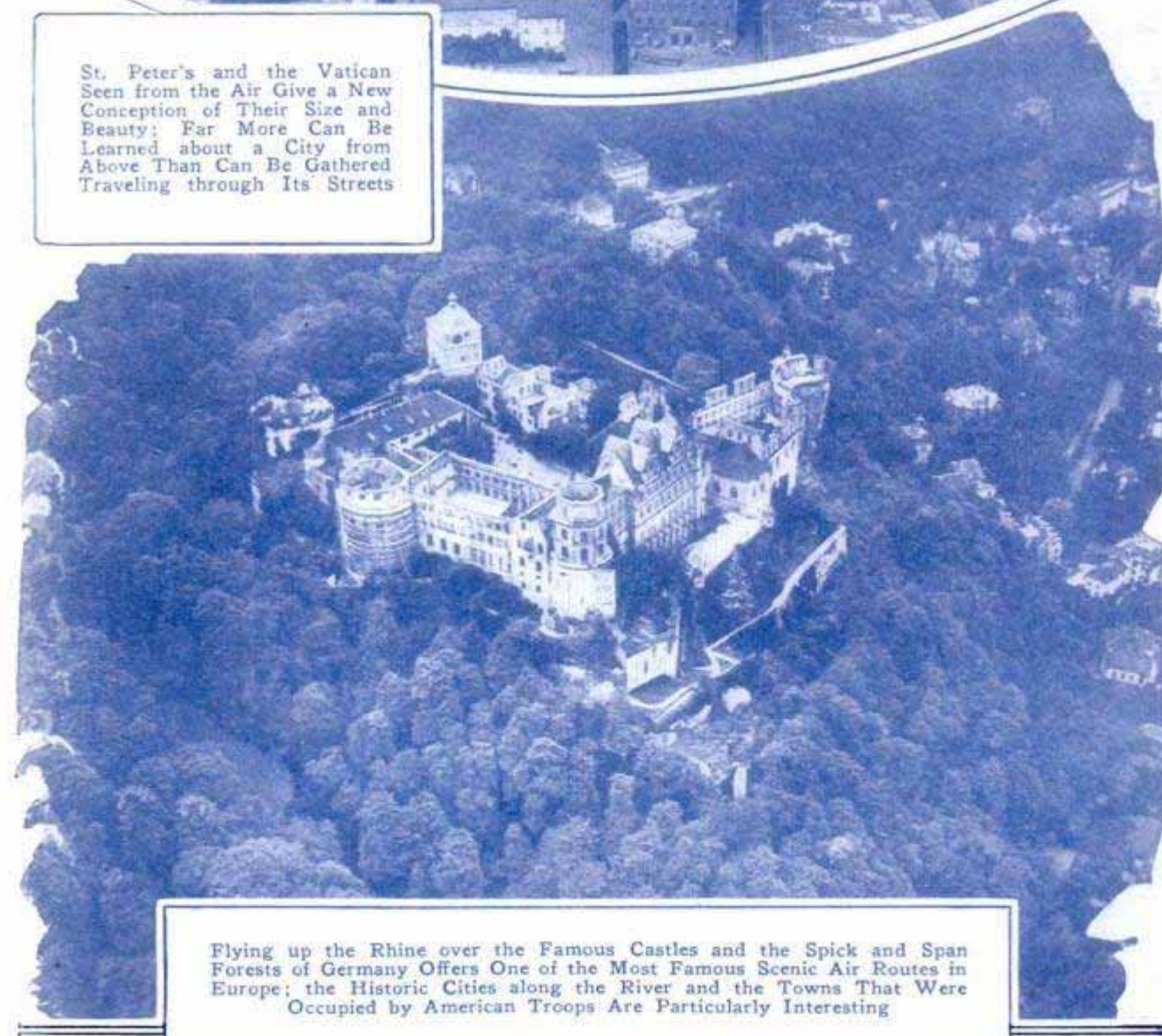


COPYRIGHT THE LONDON ILLUSTRATED NEWS

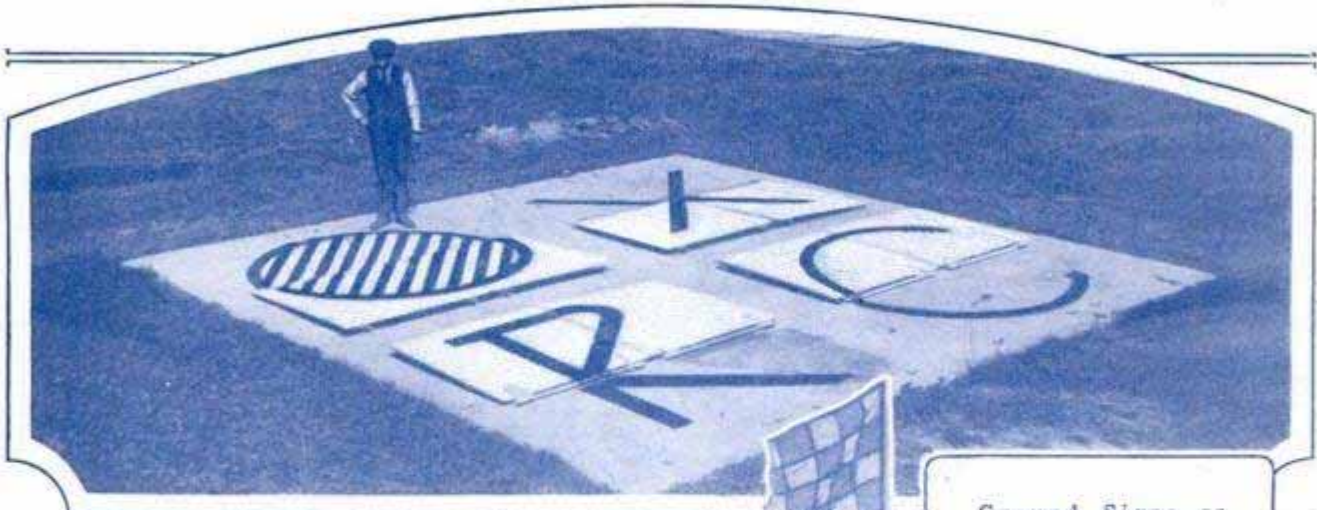
Secretary of Commerce Hoover's Air Assistant Has Just Issued Regulations for the Inspection and Licensing of Planes and Pilots in This Country, to Make Flying Equally Safe



St. Peter's and the Vatican Seen from the Air Give a New Conception of Their Size and Beauty; Far More Can Be Learned about a City from Above Than Can Be Gathered Traveling through Its Streets



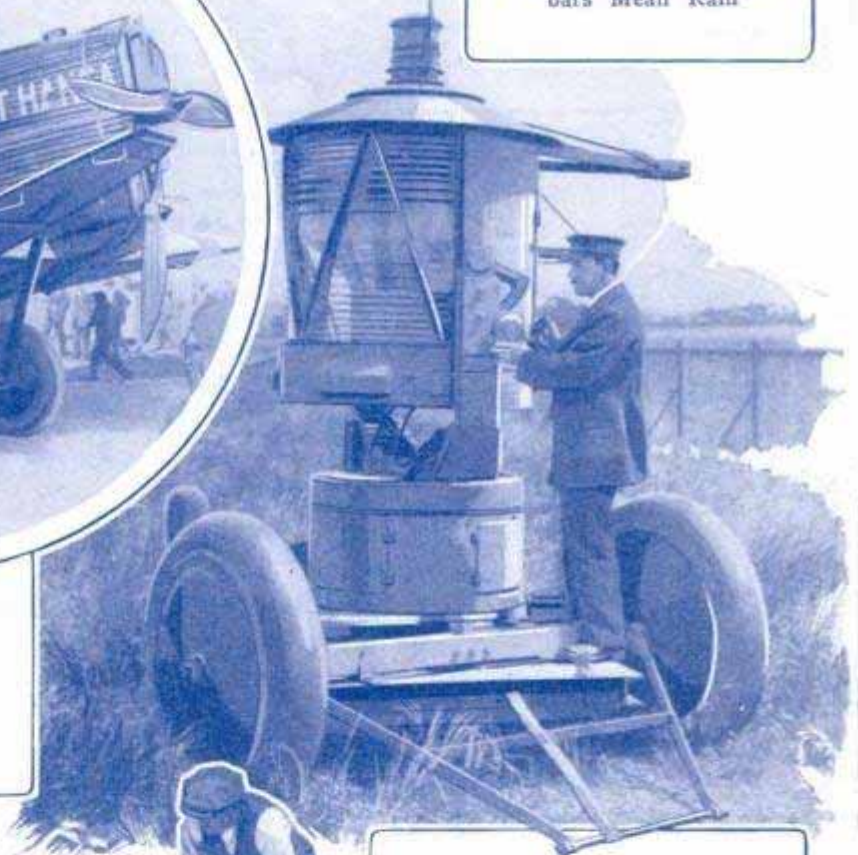
Flying up the Rhine over the Famous Castles and the Spick and Span Forests of Germany Offers One of the Most Famous Scenic Air Routes in Europe; the Historic Cities along the River and the Towns That Were Occupied by American Troops Are Particularly Interesting



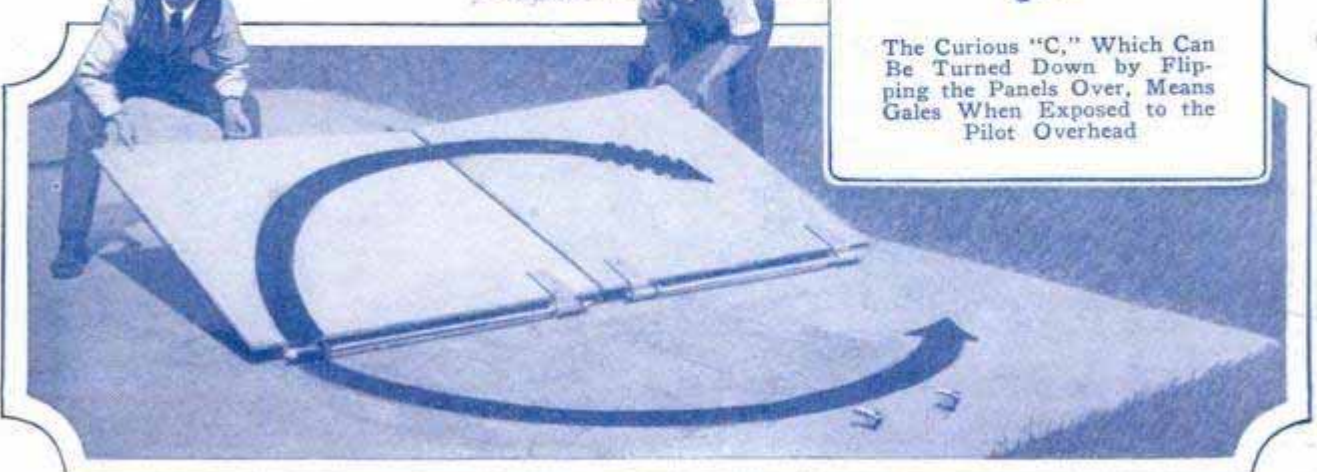
Ground Signs as Weather Warnings in England; the "X" Means Snow, Hail or Sleet; the "R" Thunderstorms, and Cross-bars Mean Rain



Pilot and Mechanician of the Big Passenger Ships Ride High above the Cabin, with a Clear View; at Right Is One of the Portable Searchlights Used to Flood German Flying Fields for Nighttime Landings

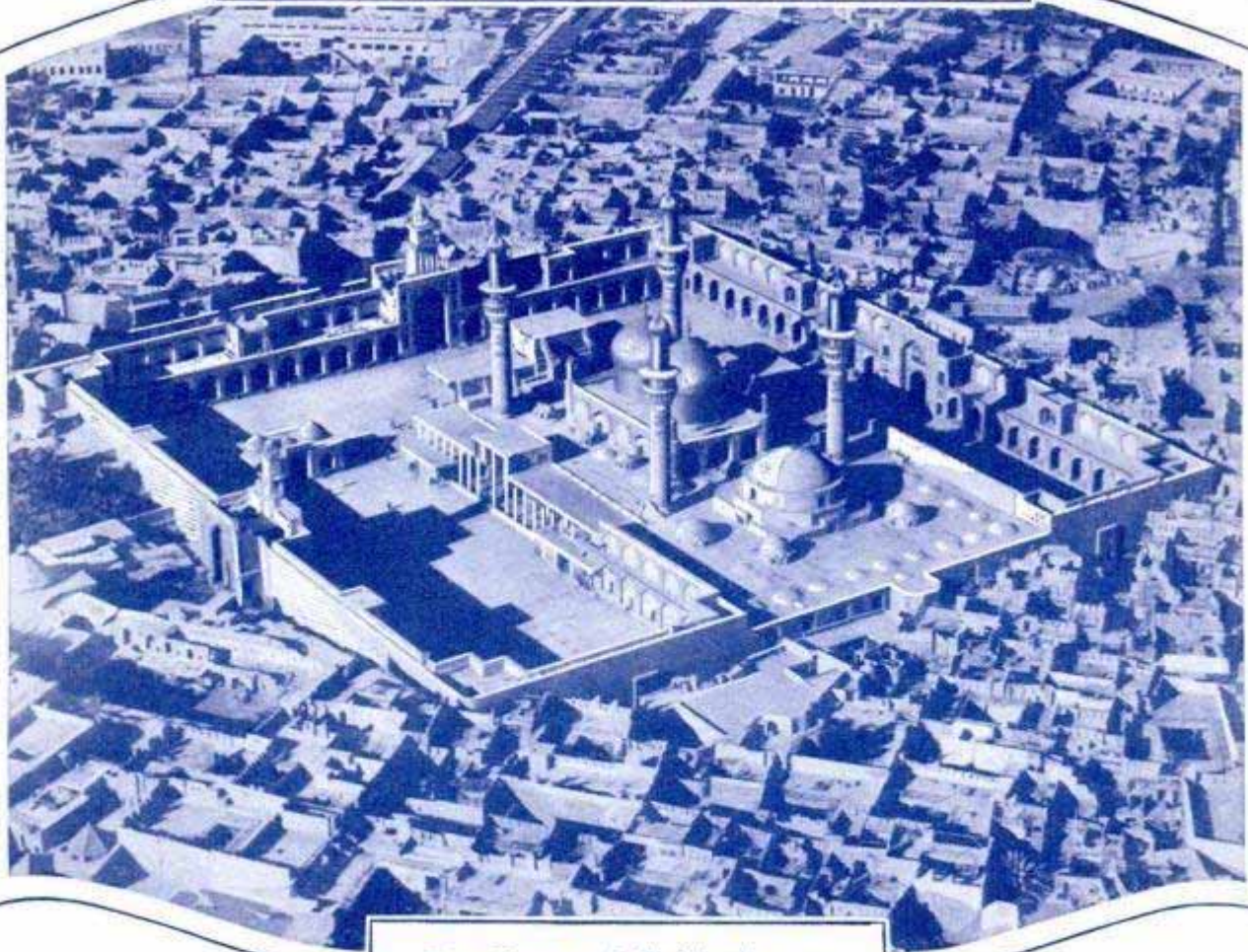


The Curious "C," Which Can Be Turned Down by Flipping the Panels Over, Means Gales When Exposed to the Pilot Overhead

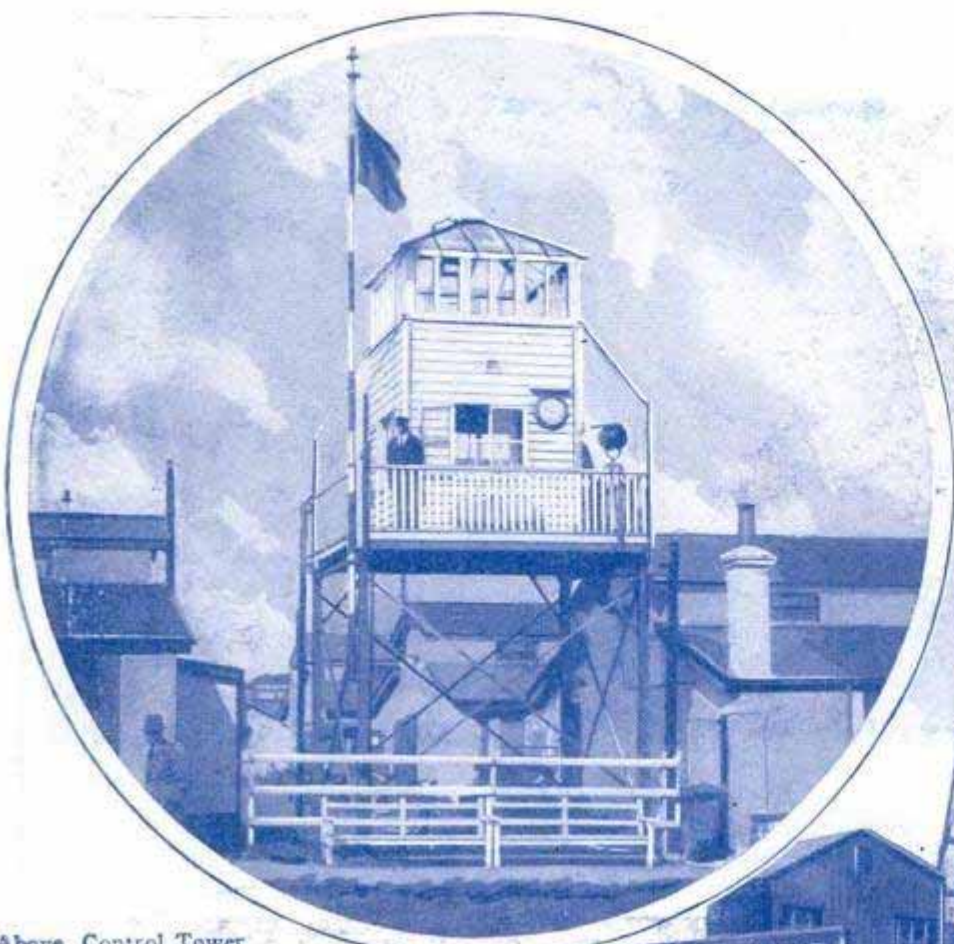




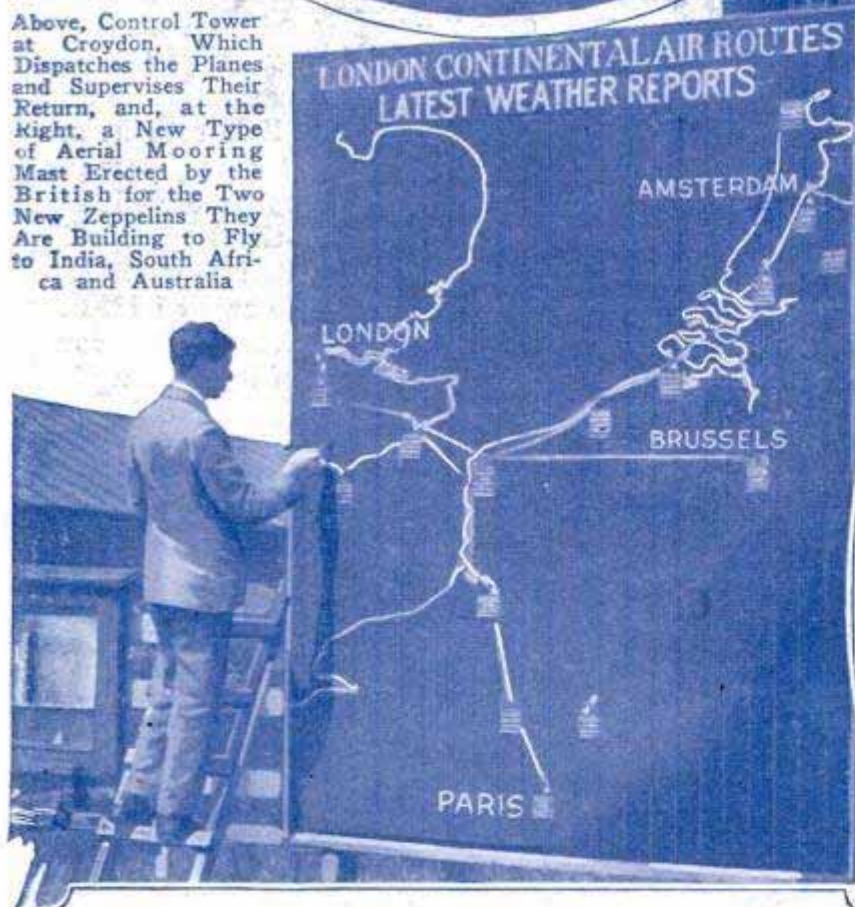
Royal Air Service Planes Passing the Pyramid of Cheops at Gizeh; British Airmen Regularly Patrol the Route to the Sudan, besides Keeping the Peace in Mesopotamia from Their Station at Bagdad



The Mosque of Kadhimain, near Bagdad, Showing a Typical Arab City from the Air; Bagdad Is on the Route to India

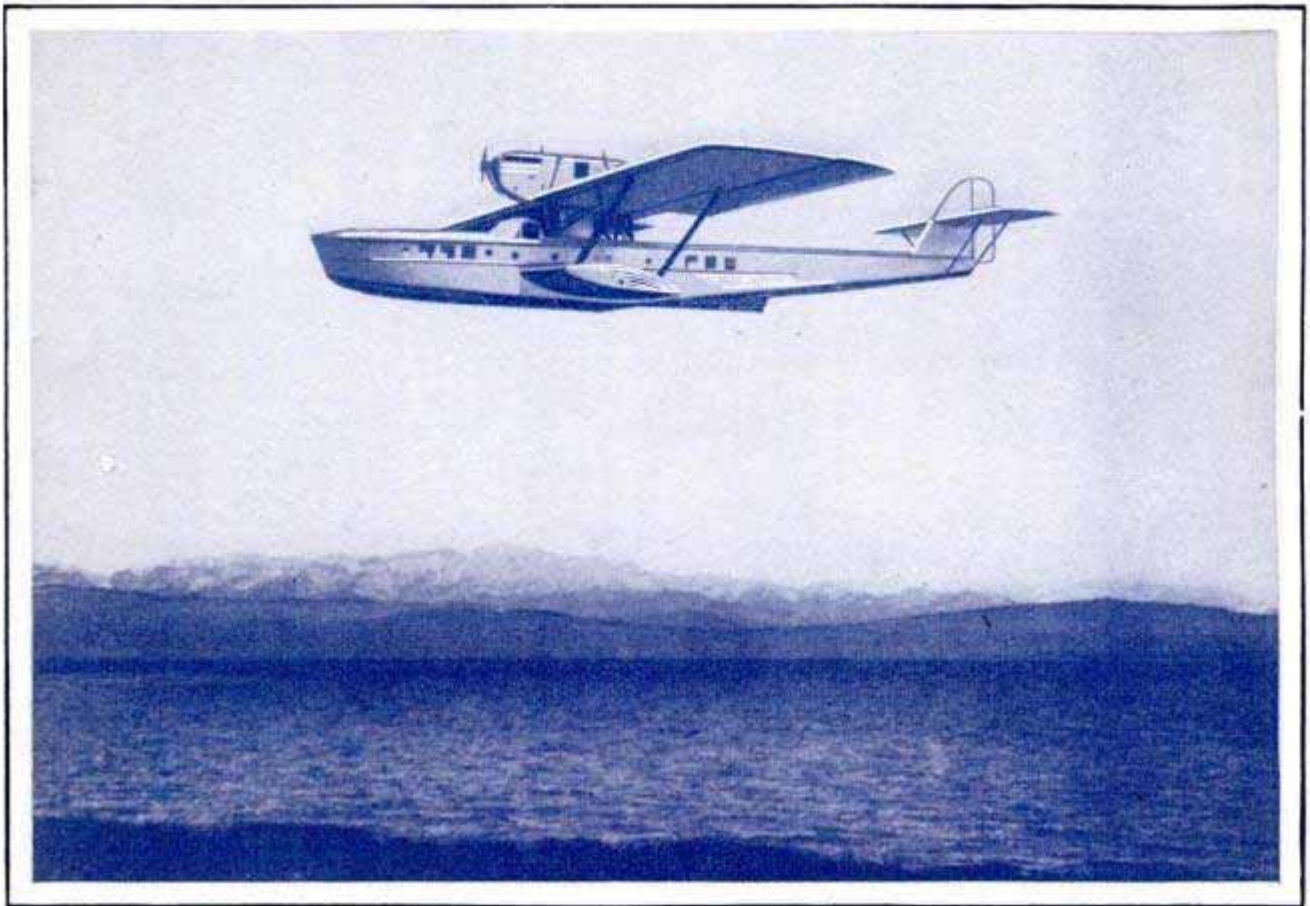


Above, Control Tower at Croydon, Which Dispatches the Planes and Supervises Their Return, and, at the Right, a New Type of Aerial Mooring Mast Erected by the British for the Two New Zeppelins They Are Building to Fly to India, South Africa and Australia



The Weather Map at Croydon Field, Where Constant Check Is Kept on Conditions at Other Airports; and at Right, a Passenger Being Weighed In, a Necessary Procedure to Keep Track of the Ship's Load





The Latest Dornier-Superwal Flying Boat from Germany: These Giant Two-Engine Craft Are Used on Air Routes to Scandinavian Countries, Because of Their Ability to Land on the Sea if Necessary

The traveler seeing Europe from the air gets an unusual and novel picture of the countries he crosses. Instead of having his vision limited to a short distance, he sees open country, farms and forests for miles on either side of the high-flying airships, and views whole cities from above, giving an unrivaled chance for picking out their famous cathedrals and public buildings.

Latest figures on civil routes in Europe show a growth of 1,200 per cent since 1919, when 1,170,000 miles were flown.

The 1925 figures were nearly twelve and a half million miles, and 1926 returns are expected to surpass that sum by many millions. The 1925 routes covered 18,025 miles, equaling some of the largest railroad systems in the United States. German air lines alone in 1925 carried 133,639 passengers. Since 1919, in more than four and a half million miles of flying, English machines have had but four fatal accidents. For an entire year, ending in March, 1926, there was not a single fatal accident on any British-operated route.



The Rear-Drive Ice Truck, Showing the Steering Wheel within Easy Reach of Back Step

1403 REAR-CONTROL AUTO ICE TRUCK SAVES DELIVERY TIME

So that the delivery man does not have to walk back and forth from the rear step to the front seat, an auto ice truck is equipped with a full set of controls behind. The arrangement saves an extra man and makes the motor vehicle more serviceable. An objection to the auto truck for ice delivery has been that, if one man is used, much of his time is spent in getting in and out of the driver's seat.

Mr. Bert Laddis, Bartlesville, Okla.

Belmont Ave.

1520.

Attawa, Canada

POPULAR MECHANICS

733

CORD TO FLOOR LAMP WINDS UP TO PREVENT ACCIDENTS

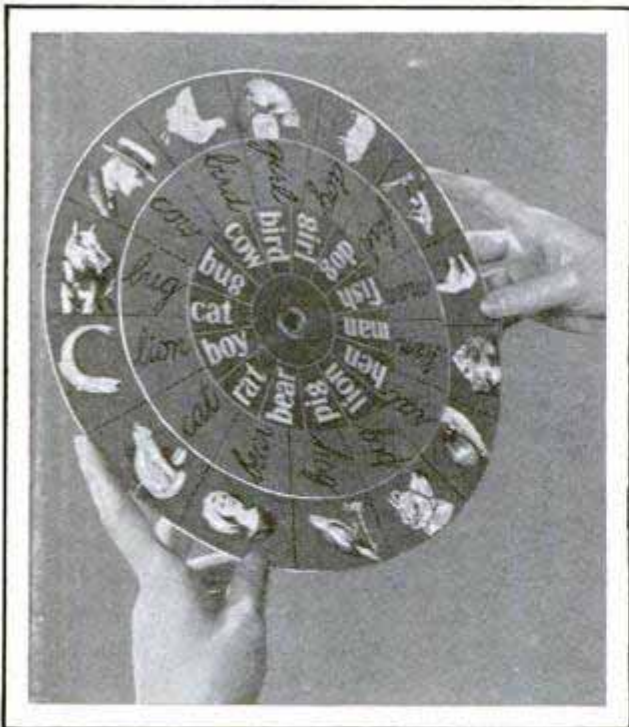
not on market 1736

Flexible lighting cord for an improved floor lamp now on the market is attached to a winding drum in the base of the lamp so that it is reeled in automatically when the stand is moved back toward the wall plug and unwinds as needed. This arrangement is intended to prolong the life of the cord, prevent tripping over it and reduce the hazard of poorly insulated parts coming in contact with rugs, carpets or furniture and causing fire.

1539

DISK GAME TEACHES CHILDREN READING AND ARITHMETIC

Children can learn as they play with a simple game consisting of a series of six revolving colored disks rotated on an axle. On one side are fourteen illustrations of common objects, opposite which, on two inner disks, are the corresponding names of the things in print and script. The reverse side of the set displays simple illustrations of arithmetical processes, figure work being developed in dots, crosses, numerals and the printed names of the numbers. Practice with the de-



Revolving Disks with Printing, Letters and Pictures on One Side and Figures on the Other

vice as a guide also helps teach the child how to write.

Krieger Novelty Co.
Lodi, Calif.



Preparing the Powder Cakes, Which Cannot Spill as Easily as the Pulverized Form and Will Last Longer

BROKEN LOOKING GLASS SPURS INVENTION OF BEAUTY AIDS

A broken mirror invites seven years of bad luck, according to popular superstition, but in the case of an eastern inventor, it led to success. Seeing a young woman crack the small mirror in her vanity case, he was inspired with the idea of making mirrors that would not break. He succeeded in fashioning one along the lines of the automobile lamp reflectors and it proved strong under severe tests. To keep the powder from spilling out of the vanity bag, he mixed a binder with it and produced a cake form that would not spill. Since then, several other things have been devised by him.

APPLAUSE AT SHOW BROADCAST TO ADVERTISE COMEDY

To assure passers-by that the film being shown at a New York picture theater is a genuine laugh provoker, the applause of the audience is transmitted to the street through a radio loud speaker near the ticket booth. Microphones distributed about the interior pick up the sounds, and without being aware of the fact, the spectators inside give an effective testimonial to the quality of the comedy.

The Rialto 42nd St.
Broadway.

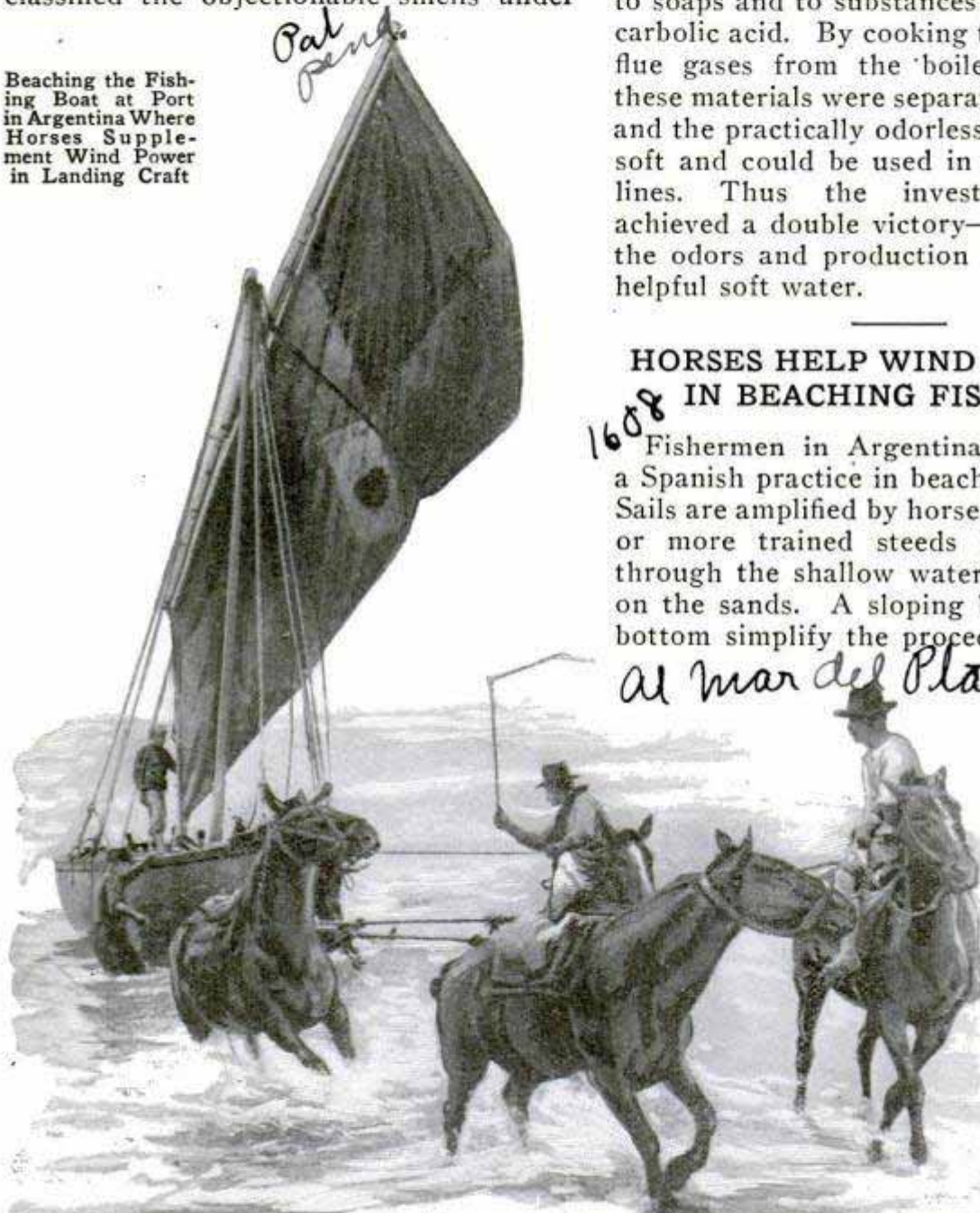
Mr. William Hearfield
Kendall, 575 Prospect Ave.
Maplewood, N.J.

OIL-REFINERY FUMES STOPPED BY SKILL OF CHEMISTS

How chemists won a battle against unpleasant fumes from oil refineries in a California field is an interesting story of a little-known side issue of a big industry—the disposal of waste products. Complaints against the odors had become so emphatic that the refineries were served with the ultimatum that they would have to shut down unless the fumes were eliminated. Chemists set to work and quickly classified the objectionable smells under

three groups, those that came from tanks containing untreated products, others from acid sludge used in a refining process, and the last group, the most bothersome of all, from caustic wash waters remaining after the treating processes had been completed. It was found that the first two were combustible. The tanks were made air-tight and fumes from them drawn off into compressors and burned, and the sludge was likewise consumed. Disposing of the vile-smelling water proved a more difficult task. Chemists traced the odor to soaps and to substances like cresol and carbolic acid. By cooking the waters with flue gases from the boiler-plant stacks, these materials were separated and burned, and the practically odorless water left was soft and could be used in the boiler-feed lines. Thus the investigators really achieved a double victory—elimination of the odors and production of a supply of helpful soft water.

Beaching the Fishing Boat at Port in Argentina Where Horses Supplement Wind Power in Landing Craft



HORSES HELP WIND AND SAILS IN BEACHING FISH BOAT

Fishermen in Argentina have adopted a Spanish practice in beaching their craft. Sails are amplified by horsepower and four or more trained steeds haul the boat through the shallow water, high and dry on the sands. A sloping beach and firm bottom simplify the procedure.

Al Mar del Plata

B+A

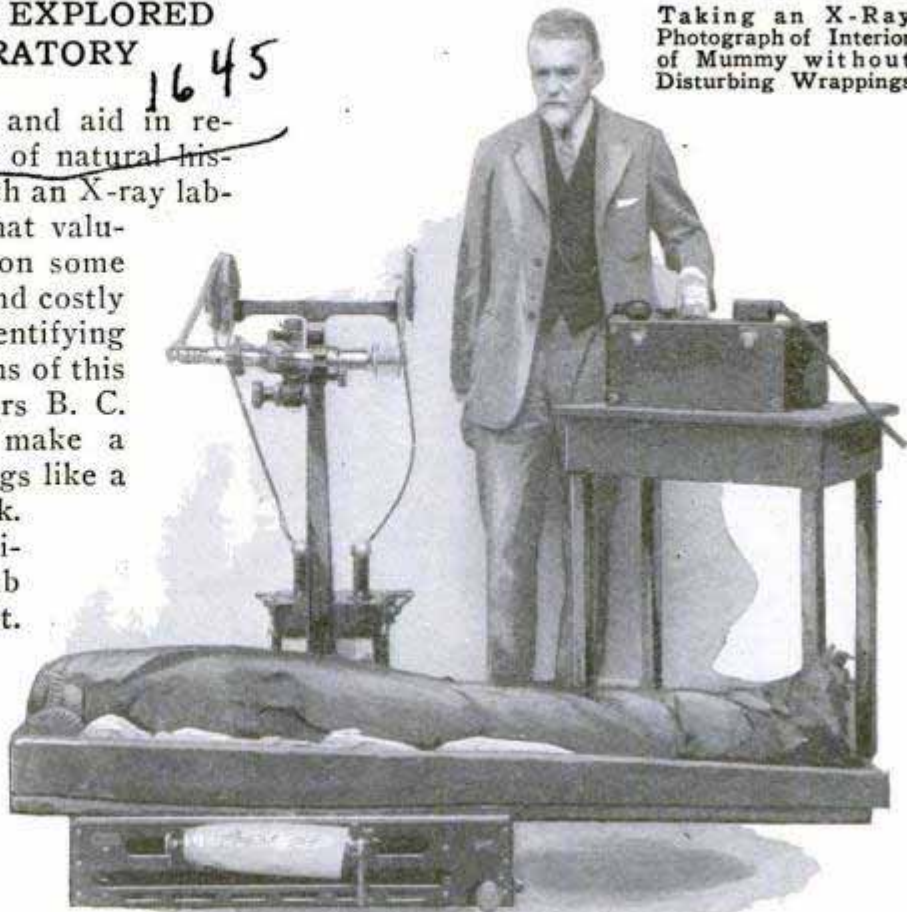
MYSTERIES OF PAST EXPLORED IN X-RAY LABORATORY

To examine specimens and aid in research, the Field museum of natural history has been equipped with an X-ray laboratory. It is expected that valuable light will be shed upon some of the secrets of the past and costly work in classifying and identifying specimens avoided by means of this apparatus. Some 200 years B. C. the Chinese started to make a special cast iron which rings like a deep bronze bell when struck. How did they do it? Possibly the X-ray may plumb the secret of this lost art. Already, mummies have been studied with the rays, the method sometimes saving unwrapping the specimen and possibly damaging it. In the case of one mummy, that of an Egyptian king, who lived some 4,000 years ago, the apparatus helped establish the fact that the ruler died of arthritis.

Courtesy Field Museum
of Natural History

The rays will also aid in determining if the wrappings conceal valuable ornaments and pottery, which can be examined to reveal the character of its under-surface work, the glaze and composition. Specimens of fish are also observed under the rays so that the contents of their stomach can be seen,

the arrangement of bones studied, making classification of some of the species more simple and eliminating the necessity for dissection and mutilation. Fossil skulls and other remains may be located with the rays and they also are used to treat and restore precious stones.



Taking an X-Ray
Photograph of Interior
of Mummy without
Disturbing Wrappings

HAND-SIZE LETTER DUPLICATOR REDUCES OFFICE COST

Copies of notices, letters and forms of many kinds can be made at the rate of forty to sixty a minute in a simple duplicating outfit that almost anyone can operate, at a reported saving over more complicated apparatus. It consists chiefly of a rocking pad somewhat like a desk blotter to hold a stencil which can be cut on a typewriter or in longhand with a stylus. The stencils are



dry and are said to stand up for thousands of impressions. Inking is simply done, and the duplicator is furnished in three sizes, of which one is for matter of post-card size, another for notes and the largest for full-letter size.

CLOTH OF SPRING-STEEL WIRE SUBSTITUTE FOR RUBBER

A substitute for ordinary elastic in garters and other articles has been found in a cloth woven with fine spring-steel wires, which give the necessary strength and are said to outlast rubber. The material is treated to resist rust, and is said to be impervious to perspiration.

Steelastie Co.
Lancet Ave

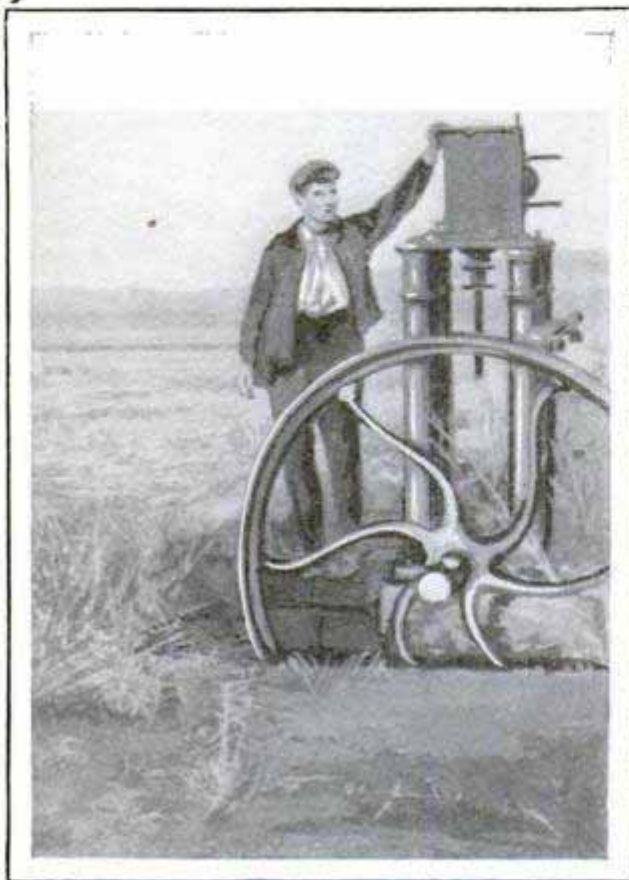
Simplificator Corp
136 Liberty St.

note size can be used for postcard

1645

1696

MYSTERY IN OLD STEAM ENGINE ABANDONED ON DESERT



A Reminder of Early Gold-Rush Days: Old Steam Engine Abandoned on Nevada Desert

Seventy-five miles north of Tonopah, Nev., the traveler comes upon a curiosity in the form of an abandoned steam engine which has been standing on the desert since the late '50's, unclaimed and unused but still in good condition in spite of the years of sun and storms. It has been learned that the engine was built in England, shipped around the Horn to San Francisco whence it was sent by ox wagon to a mining company. But the wagon broke down, the engine was unloaded and left behind, and no one ever came to claim it. Although now old-fashioned and out of date, a mechanic would probably say that it "was a beautiful piece of machinery in its day." The uprights are solid cast iron inlaid with brass in fancy designs. The rim of the fly-wheel is cast solid with

wrought-iron spokes. The cylinder has a six-inch bore and a stroke of about sixteen and one-half inches.

WOMEN SUCCEED AS INVENTORS SOLVING HOME PROBLEMS

Finding that ordinary chairs were soon ruined if left on porches during rains, a Missouri woman introduced a birch chair capable of withstanding adverse weather conditions. From this article, which was patented, came the idea for a rocker with a drawer in it to hold sewing or writing supplies, a utility folding table and an adjustable reclining chair, all devised to meet some particular need of the household. She and her husband now hold seven patents. Another woman, past sixty years old, has developed an extensive bakery business from a process for making whole-wheat bread.

TINY PLANE FLIES FORTY MILES ON GALLON OF GASOLINE

Safety and economy are claimed for a small monoplane which has been devised for the purpose of bringing flying within the reach of the man of moderate means. The craft is sturdily constructed, the fuselage being of the steel-tube type, the wing spread is twenty-three feet, total weight 300 pounds, and the motorcycle engine affords a speed of seventy-five miles an hour in flight and a landing speed of but thirty-two miles, to insure greater safety. From thirty-five to forty miles on a gallon of gasoline is the usual performance. It sells for only \$575, complete and ready to fly.



Illustrating the Light Weight of the "Flivver" Airplane Designed for Flying at a Minimum of Expense

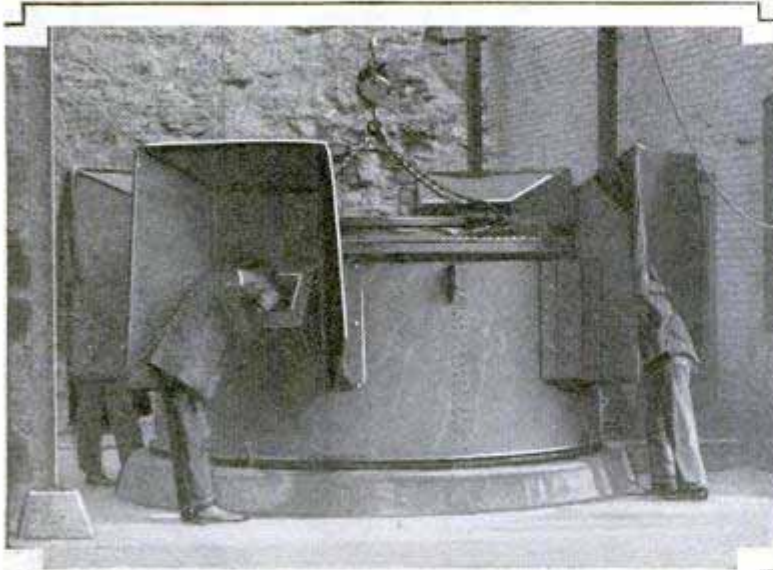
Heath Airplane Co.
2856 Broadway

at San Antonio

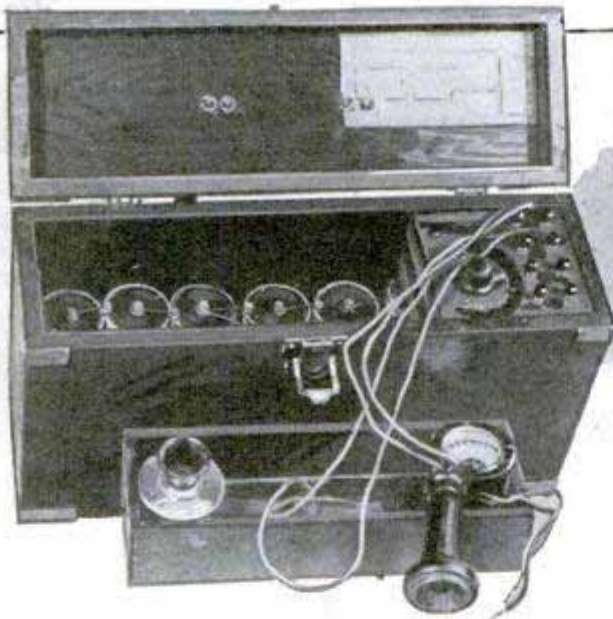
Miller

1927 Sedgwick

KEEPING PHONES FROM BLOWING UP COAL MINES



Watching Gas Explosions Caused by Telephone in Testing Chamber, and Type of Wireless Phone for Mine Use



Using Special Mine Telephone in Pennsylvania Shaft; the Instrument Is Shielded in Order to Prevent Explosions

That a telephone may blow up a coal mine is shown by government tests. The source of trouble is in the expenditure of electrical energy in ringing the bell of the phone and in the fact that minute joints in the instrument are not constructed to prevent the entrance of gases that might be ignited by tiny sparks. Tests of telephones for mines are conducted in a large gallery so arranged that it can be filled with explosive mixtures of gas and air in any proportions desired and the results studied through windows. As a consequence, it has been recommended that parts of the phone, such as the magneto, the hook switch and

other units capable of igniting explosive gas mixtures be placed in special compartments when intended for mine use. Engineers of the bureau have also devised a wireless phone especially for communication in the mines. It employs dry cells and modified telephone parts, and is said to have transmitted the voice through 400 feet of earth and rock. It is believed that the apparatus will be of special aid in case of fires and cave-ins.

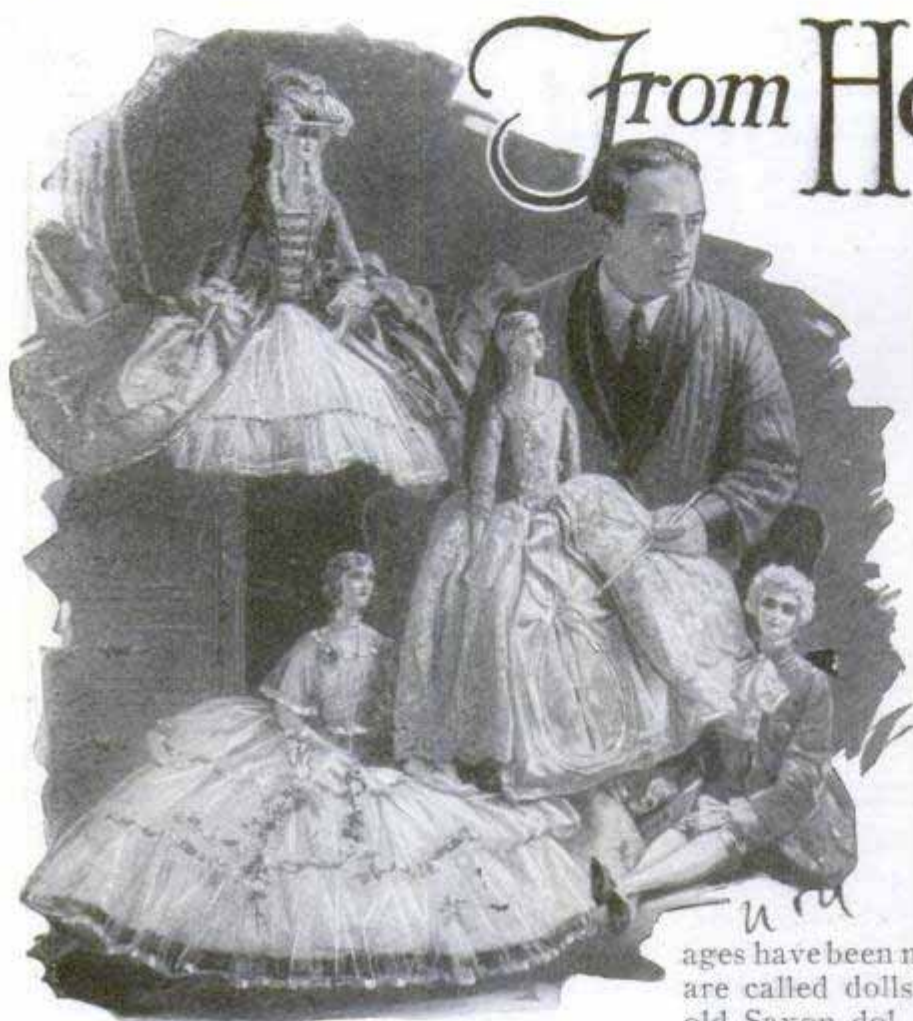
STEEL BAR WITH TURNING CORE 1695 DEFIES CUTTING

Bars which cannot be broken or sawed through with ordinary tools are being made in the form of an outer steel casing and an inner revolving core which turns as soon as the saw strikes it and cannot be severed. They are adapted for installation in banks, prisons and similar places, and outwardly resemble an ordinary bar.

Wm. A. E. Anakin & Co.
Mfr. A. E. Anakin & Co.

Long Beach, Calif.

1418



From Heathen

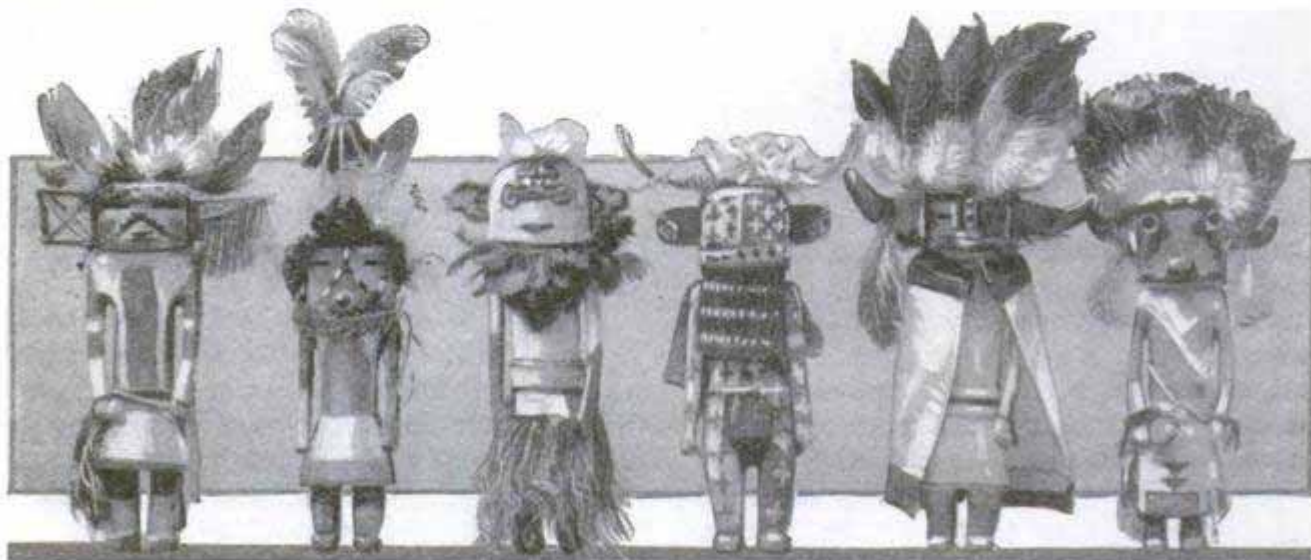
The original doll was made as an image of a heathen god, so dolls not only have title to being the oldest created thing of which archæology has record, but likewise claim the title of being the oldest work of art. Though they have lost their position as images of the spirit world, they retain an honorable standing in many lands where they are still used in religious rites, and in others, as Japan, where they are used to inculcate patriotism.

"For ages," says Mr. Hough, "significant images have been made by man. These images are called dolls, a word derived from the old Saxon *dol*. It would seem that from the obese Venuses of the Aurignacian epoch, the oldest recovered figurines and first-known sculptures in the round, there has been a gradual and tremendous increase in the number and assigned meaning of images, large and small, having, so far as we can see, developed around the idea that cropped up in that period."

Those first dolls, the fat little figures which marked the first excursion into ac-

Modern French Dolls for Grown-Up Ladies, and Their Creator, a Paris Movie Star, Who Designs Them

Gaston Julia
THE latest thing in Paris dolls, with self-closing eyelids and a voice mechanism that provides a one-word vocabulary, is the direct lineal descendant of a mud image made 25,000 years ago, according to Walter Hough, of the National Museum, at Washington, who has traced the development of the doll through the centuries.



Courtesy Field Museum

Idols to Playthings

tual sculpture in imitation of a human body, were all cult objects. They represented, according to Mr. Hough, man's first attempt to control the unseen by creating a tangible figure to house the spirits he worshiped.

"Perhaps," he says, "the first great problem to confront man was that of death, and it is evident that he had very early perceived that death was a transfer of something from the chief focus to another place or status. There arise here a multitude of observances and rites to separate the ghost from his former affiliations and a host of beliefs originate concerning the state, powers, influences and existence of the ghost."

From the early groping for knowledge regarding death and the future state of the spirit grew all the later religious ideas of pagan civilization. In the earlier days, the figures created as residences for the ghosts were miniatures, but as time passed became larger and larger, and finally monumental idols were built and given correspondingly greater attributes. For the purpose of personal worship, small figures continued to be made, but gradually the bigger dolls, embodied with the spirit of the gods, occupied an increasingly commanding position.

Dr. Hough found that dolls were seldom



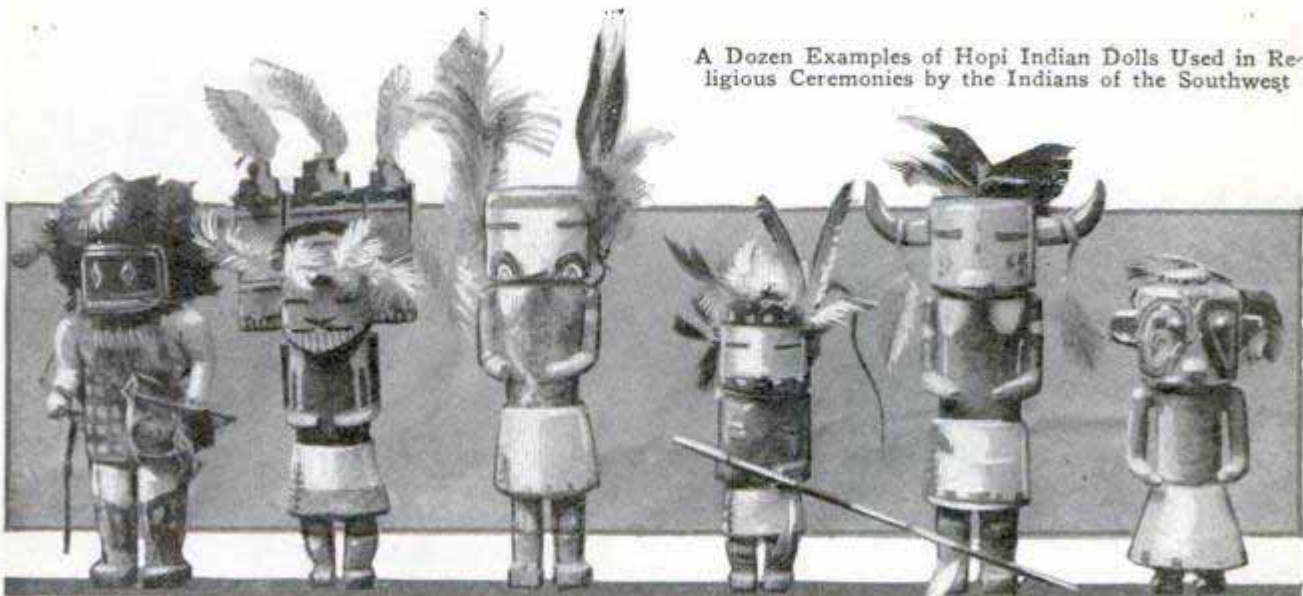
Courtesy Chicago Art Institute

Chinese Mandarin Doll in Full Costume, and an Ornate Elizabethan Lady

used among peoples of lower culture. This, he says, is a fact of great importance, especially as it might be inferred that all races have a community of instinct which would lead them to give dolls to their offspring, and that infants of all times and races must naturally demand them.

Instead, he found, that the earliest doll known to the American Indians was one

A Dozen Examples of Hopi Indian Dolls Used in Religious Ceremonies by the Indians of the Southwest



of Natural History

1418
dressed in all the frills and ruffles of the Elizabethan period, plainly brought over by some explorer in the sixteenth century. Earlier relics of the Indians, while abounding in pots and vases for ceremonial use, with the figures painted or raised on their surfaces, show no traces of actual dolls or other small images.

Despite their late start, however, the Indians apparently lost little time in building up a doll cult, and several of the tribes, particularly the Hopis, have produced enormous quantities of them. The Hopi dolls, called "Tihus," are representatives of the Katcinas, supernatural beings, or the masked men who impersonate them in the tribal dances. All dolls are more or less faithful representations of a deity or some fetish which is used in religious ceremony, but apparently, after the dance is over and they are passed on to the children, retain no religious significance, for old ones are thrown away with the trash, and the best of them are readily sold by the children for any attractive thing the tourist has to offer.

The Hopi dolls, in addition to imitating the deities and fetishes, include clowns and jesters. The dolls are usually made of cottonwood roots, painted in the six colors that represent the four cardinal points and the above and below—yellow, blue, red, white, black and gray.

In Japan, dolls play such an important part that a national dolls' holiday is observed on the third day of the third month, but its significance is patriotic rather than religious. The dolls' festival is observed by erecting a screen before which is placed two dolls representing the emperor and empress, while at their feet is a band of five musicians, four with tiny instruments and the fifth with a folded fan to direct the orchestra. The musicians in turn are flanked by two dolls, one a bearded figure representing the elder court minister, and the other a young man for the younger court minister.

When the dolls are all in place, the girls put offerings of food before them on tiny stands of lacquer or silver. The dolls are elaborately dressed, with removable hats, every detail of court costume being correctly reproduced, and some of them are of great value, having been handed down from one generation to the next for several centuries.

"The history of the doll is most complex," Dr. Hough says, "and leads quickly back and away from childish hands to idols, which are the representations in the sense of personations of spiritual beings or divinized ancestors, back again to the images commanded to do the bidding of sorcerers and medicine men, to charms, fetishes, household gods, objects of witch-



Courtesy Field Museum of Natural History

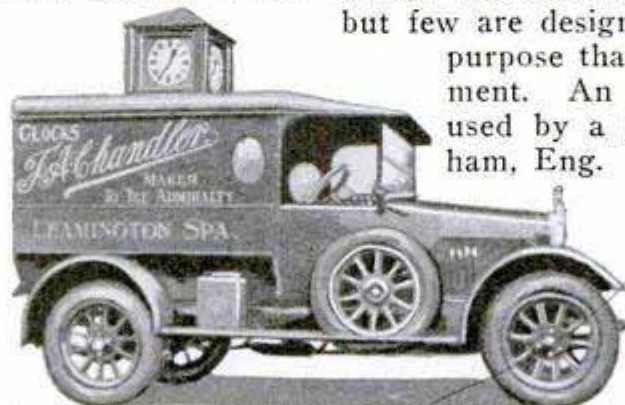
Every Japanese Girl Must Have Nine Dolls, Representing the Empress and Emperor, before the Painted Screen, the Elder and Younger Court Ministers and the Five Court Musicians

craft, and so forth, and from them back to the rude sticks and stones of undeveloped tribes, with their crude ideas of mysterious life in inanimate objects working weal or woe for man."

Among civilized people, dolls, he says, awake no thought of their former import, but before careless acceptance of them as playthings came, there were many relapses. Both the Mosaic law against worshipping graven images and the Mohammedan injunction against creating any form of statue representing the human form, grew out of the necessity of keeping the people from former superstitious beliefs.

WOULD CUT FARMER'S YEAR TO TWENTY DAYS

On an experimental farm near Dearborn, Mich., Henry Ford plans a series of demonstrations to show how time and labor can be saved by the use of improved appliances and efficient methods in the growing of crops. He estimates that twenty days of actual work would be sufficient for the planting and harvesting of wheat, for instance, and suggests that agricultural contractors, equipped with the necessary tools and labor, could go from farm to farm and do, in less time and with considerable saving, work that farmers now take many days to accomplish. Two days would be allowed for plowing and harrowing, one day for planting, and five for cultivation during growth, while harvesting and threshing would require but two days with the use of machines, which cut, thresh and bag the wheat as they are drawn through the field by a tractor. The remaining ten days of the allotted time would be devoted to ditching, fencing, distribution of fertilizer and similar tasks, that might fairly be charged to the cost of producing a particular crop. Mr. Ford's plan does not apply to dairy farming or to raising live stock, and it is understood that it would have to be modified where irrigation and "dry farming" prevail.



Keeping Time for the Whole Town: Clockmaker's Delivery Car with Four-Dialed Clock That Runs



The Telephone Hourglass; Sand Runs from Upper to Lower Pocket in Three Minutes

SAND GLASS TIMES PHONE CALL TO THREE-MINUTE LIMIT

Hourglasses are out of date as time-keepers, but practical use for them in connection with the telephone has been suggested in a visible gauge to inform the talker if he is exceeding the three minutes allowed. A small tube-shaped glass is attached to the mouthpiece. Sand runs from the top to the bottom in just three minutes. By simply swinging the gauge around with the mouthpiece as a pivot, the glass is ready for recording another three-minute period.

CLOCK ON WATCHMAKER'S CAR ATTRACTS ATTENTION

Delivery cars in various shapes, to advertise the owner's wares, are not new, but few are designed to serve any other purpose than the firm's announcement. An exception is the auto used by a jeweler near Birmingham, Eng. On the top is a four-dialed clock which keeps accurate time and is so clearly marked that it can be read at a considerable distance, thus rendering a community service.

*Terre Haute Advertising Co.
Terre Haute, Ind.
make such glasses!*

*Chicago Daily News
2/9/17*

*H.A. Chandler Leamington
Spa near Birmingham*

23 1 Howland St. Carbon Corp
742 Tottenham Court Road POPULAR MECHANICS 302 42nd St.
London W. 1. Eng. New York City

742

A black and white photograph showing a man in a white lab coat or shirt operating a large, complex industrial machine. The machine has a large cylindrical component on top and a base with various adjustment knobs and a hand crank. The man is leaning over the machine, adjusting a component. The background shows a laboratory or industrial setting with pipes and other equipment.

7 Milking Time on the Motor Vessel "Asturias"; Mixing the Milk Powder, Butter and Water

MOTOR SHIP'S ELECTRIC "COW" GIVES MILK DAILY

Passengers on the motor vessel "Asturias" enjoy the practical equivalent of fresh milk daily while on voyages, for the ship is equipped with a "cow" in the form of an electric mixer which blends the proper proportions of milk powder, unsalted butter and water into various grades of milk and cream. From sixty to eighty gallons are produced daily and, when the ship has many passengers, two "milking" are necessary each day. The caretaker has christened the mixer "Fanny."

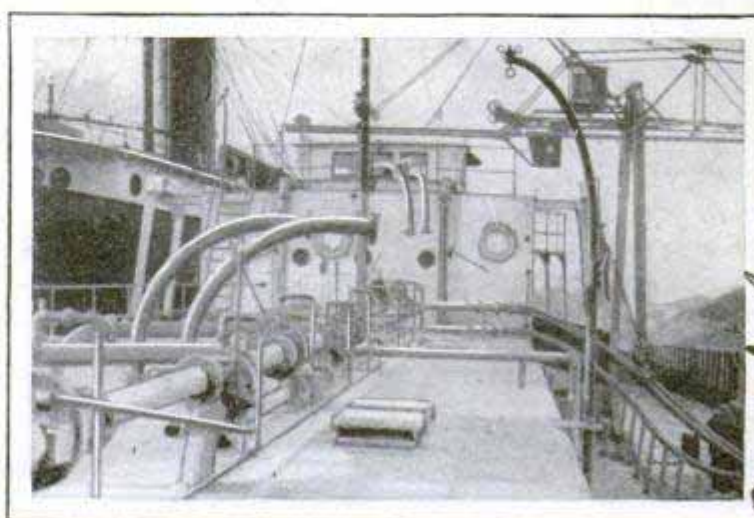
ELECTRIC GAS DETECTOR PREVENTS EXPLOSIONS

To reveal the presence of "fire damp" or methane, a gas that causes explosions in coal mines, an electrical detector has been devised which is expected to prove far more efficient than other units of its kind, and to greatly reduce the loss of life due to accidental

blasts of this character. Methane gives no warning odor, but may accumulate until a chance spark sets it off, hence it is more dangerous than some of the other mine gases. But the new detector, tests have indicated, will unfailingly expose the deadly gas. It consists chiefly of a small filament of platinum kept at a constant heat by means of a portable storage battery. A dial indicator shows the temperature at all times. If the filament is taken into atmosphere containing methane, the heated wire causes combustion of the gas with a consequent rise in the temperature which is shown by the indicator. If a danger point is reached, the needle on the indicator swings back and forth rapidly to give an additional warning.

12-2 S Michigan Chicago
CEMENT LOADED BY AIR BLAST
ON LAKE BOATS

Blowing a ship's cargo into its compartments by means of compressed air, and removing it in the same way sounds fanciful but that is the procedure on the "Daniel McCool," a lake boat carrying bulk cement between Manitowoc, Milwaukee and Chicago, on Lake Michigan. The air method saves handling bags with the attendant bother and loss from breakage. The cement is blown through pipes to the boat directly from the works, although there is a bag-filling apparatus on the craft for the delivery of small orders. Diesel engines and electrically driven propellers, as well as many other modern features, are found on the boat, which is said to be the only one of its kind.



On Board the Bulk-Cement Carrier "Daniel McCool": the Compressed-Air Lines for Loading and Unloading Are Visible

Morton Machine Co Presses Kerns Emulsifiers, Ltd. 473 Waterloo
 , 6000 1st Road, London, (beardens, London, E.C. England.
 -3- 0

built by mantawee
of hip building
Mrs

Owned by Badger
Pine & Co.

Making YOUR OWN Weather



The Wet and Dry-Bulb Thermometers Give the Relative Humidity, or Percentage of Moisture in the Air, Which Is One of the Most Important Weather Factors

By J. EARLE MILLER

EVERY home should be its own weather observatory, Dr. Alexander McAdie, director of Harvard's Blue Hill observatory, recently told a gathering of scientists. And with simple instruments and no previous training it is possible not only to tell much about the coming weather, but, especially in winter, correct conditions that cause colds, sore throat and other troubles.

The chief cause of winter colds is humidity, a term that is heard often in the summer time, but is seldom mentioned in the cold months. Relative humidity is the amount of moisture in the air compared with the limit it could hold if fully saturated. On a muggy summer's day, when the air is thoroughly saturated with water, everybody feels uncomfortable because the air has all the moisture it wants, and hence cannot evaporate perspiration, and it is the evaporation that cools the body. Since there is no evaporation, the body remains damp, sticky, and hot.

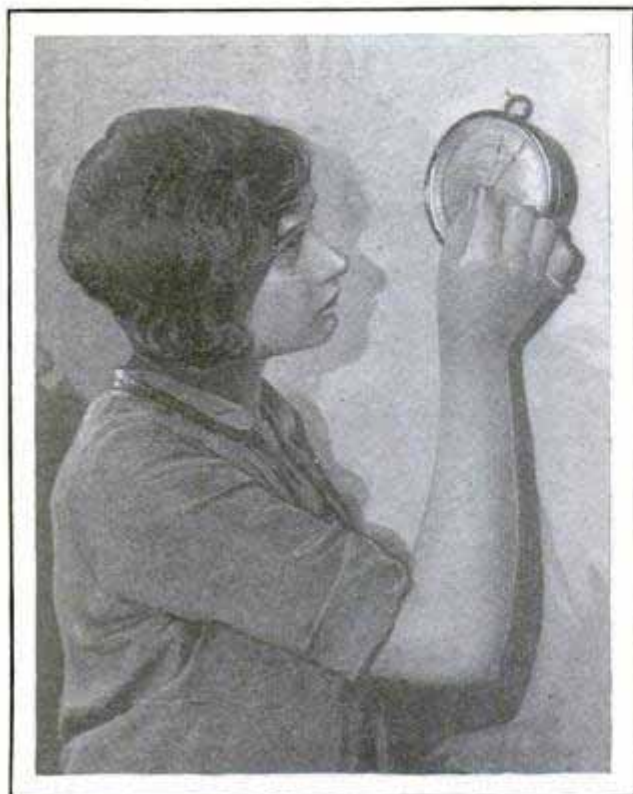
But in the winter, when modern steam-heating plants have dried out the air in the house, the atmosphere begins to draw out moisture which the body cannot af-

ford to give up, and as it evaporates, it cools the body until one feels chilly, despite the fact that the temperature may be higher than it should be in the interest of good health.

The only way to correct the trouble is to provide enough moisture to charge the air, which can be done by placing a container of water over the radiator, or, better still, hanging a wet Turkish bath towel over it, preferably on the back where it will be out of sight.

To tell whether the air needs moisture, however, and to tell when it has enough, requires some way of measuring its water content. A simple method is to use a wet and dry-bulb thermometer, which can be obtained for as little as \$5. It is simply two ordinary thermometers such as are used for measuring room temperatures, but one is fitted with a little muslin sack over its bulb, the end of the cloth projecting down into a tube filled with water. The cloth draws up the moisture and it evaporates into the air, cooling the bulb just as evaporation of perspiration cools the body. The drier the air, the faster the water will evaporate, the more the

129 E Madison Taylor Instrument Co
Rochester, NY



After Reading the Barometer, Move the Set Hand over the Indicator So That Change Will Be Apparent

bulb will be cooled, and the lower the reading of the thermometer will be. A glance at the two shows several degrees difference between them and comparison of this difference and the dry-bulb reading with a printed table gives the correct answer in relative humidity.

Weather bureau reports for Rochester, N. Y., show an average January temperature, out of doors, for a period of thirty years of twenty-four degrees above zero, and an average humidity for the same period of seventy-eight per cent—in other words the air outside was seventy-eight per cent saturated with moisture. The average home, though, kept at a temperature of about seventy-two degrees, rarely has a humidity exceeding twenty-two per cent. With the addition of forty or fifty per cent more moisture the temperature could be allowed to drop several degrees, for a person feels warmer in moist air at sixty-five degrees than in dry air at seventy-five.

For forecasting coming weather, nothing equals a good barometer, since its readings indicate what conditions will be from twelve to twenty-four hours in the future. Storm centers are always areas of rarefied air, or low pressure, while fair weather is always accompanied by denser

air and higher pressure. It follows, then, that a falling barometer indicates an approaching storm or unsettled weather, and a rising barometer the probability of good weather.

The growing use of barometers, hygrometers and other weather instruments has helped explode a lot of ancient weather myths. Not many people do their planting according to the moon's phases any more, and fewer still try to get their weather predictions from the same source. The best proof that the moon does not affect the earth's weather, according to weather experts, is the fact that the same moon shines on every section of the earth each twenty-four hours and if it did have any effect, then all the world would be affected in the same manner.

A common belief in the past was that if the horns of the moon are turned up, the ensuing month will be wet, and if the horns are down the next month will be dry. Weather records over many years exploded that idea. One of the last of the weather myths to go was the idea that there were equinoctial storms. The only way to prove or disprove any weather lore is to compare it with known weather records over a long term of years, and in this case the records show that storms are no more likely to occur during the

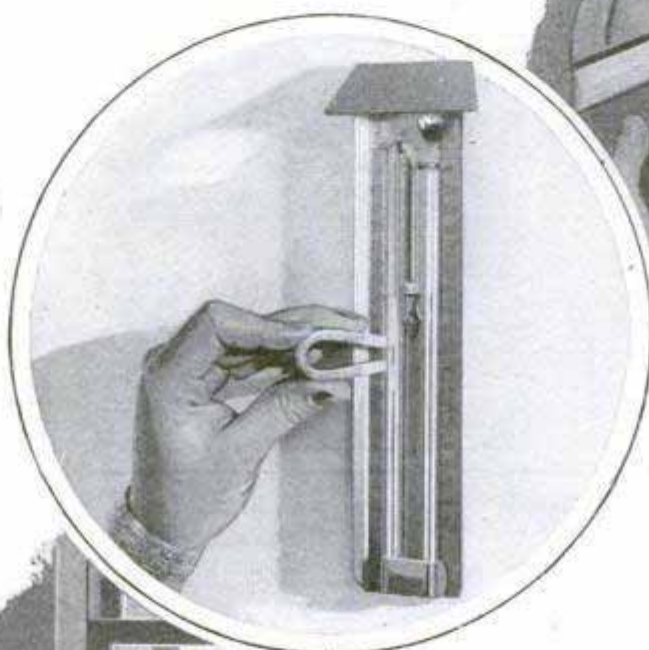


Cold or Hot Impression May Not Be Due to Weather, as a Physician's Thermometer Will Show

spring and autumn equinoxes than they are during certain of the moon's phases.

Equally untenable is the theory held by many of the older generation that the seasons are changing, winters becoming milder and snowless. Old-timers frequently tell of the tremendous snows in their days down on the farm, but after subtracting a proper allowance for the exaggerations of memory, a comparison of modern and old-time weather records shows that snows today are just as deep as they ever were. Snows, a weather-bureau cynic observes, naturally looked deeper to the three-foot boy trudging a mile down a country road to a little red-brick schoolhouse than they do to a six-foot man rolling to the office in a high-powered car over a paved boulevard from which gasoline-driven sweepers and shovels have already removed the night's fall.

The whole pseudo science of long-distance forecasting, on which such



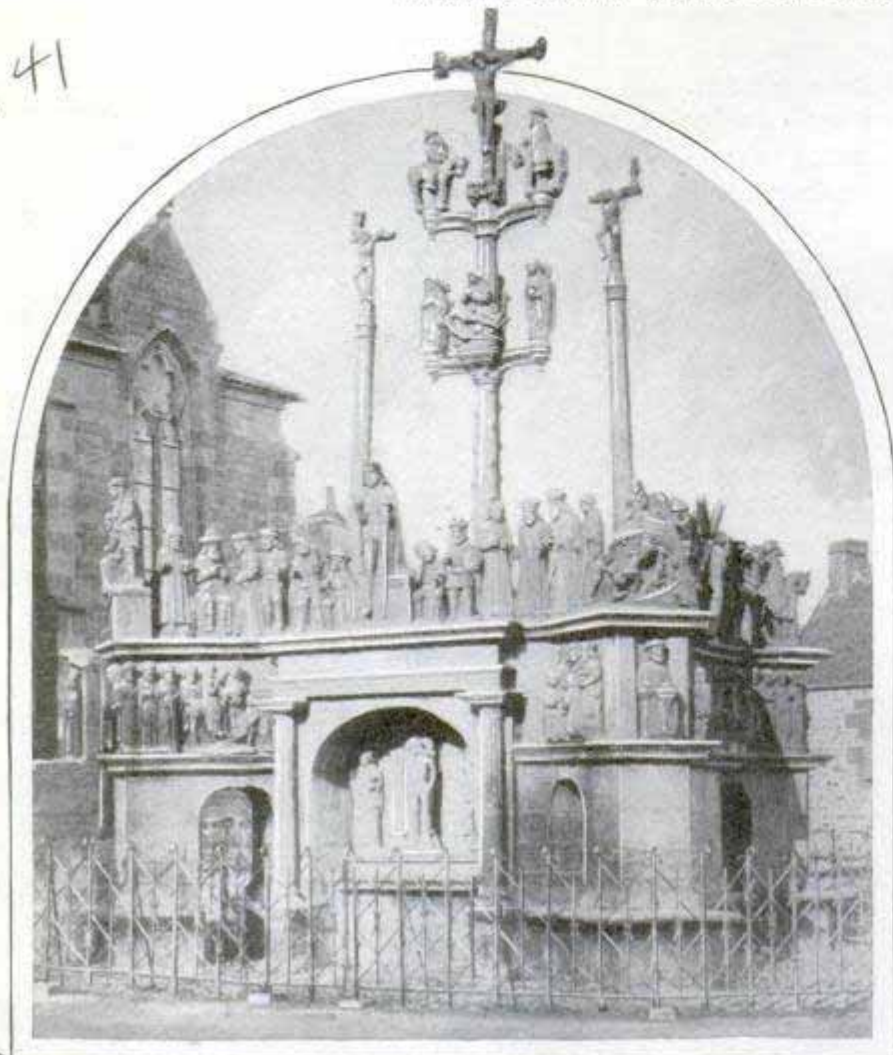
prophecies are based, is looked at askance by weather experts. The government will hazard a prediction a week in advance, based on storm

movements of the week just passed, but at the same time realizes that any one of a number of conditions may arise to upset the whole basis for the announcements.

There is one exception, though, and that is the fact that the weather apparently does travel in cycles. Dr. E. Bruckner, the discoverer of the cycle theory, found that climatic changes tended to come in cycles of approximately thirty-five years. One-half of the years in each cycle tend to be cool and rainy and the other half warm and dry. Alfred J. Henry, of the weather bureau, has been working for several years on weather data of the United States to determine whether the changes supported Bruckner's theory. He announced recently that both temperature and rain apparently oscillated up and down in an irregular manner, but on the average in cycles of seven to ten years.



Indoor and Outdoor Thermometers, Top and Bottom, and, Center, a Maximum and Minimum Thermometer with Indicators Reset by a Magnet



Elaborate Calvary Erected More Than 300 Years Ago near Brest, France,
Where Bubonic Plague Claimed Many Lives

STATUE CENTURIES OLD MARKS SCENE OF DEADLY PLAGUE

Commemorating deliverance from a fearful plague that claimed nearly half the population in 1598, a calvary near Brest, France, is one of the interesting landmarks shown to tourists. It was erected more than 300 years ago, but is remarkably well preserved, even to details on the many figures in the group.

WHERE TO PLACE YOUR PIANO TO GET BEST MUSIC

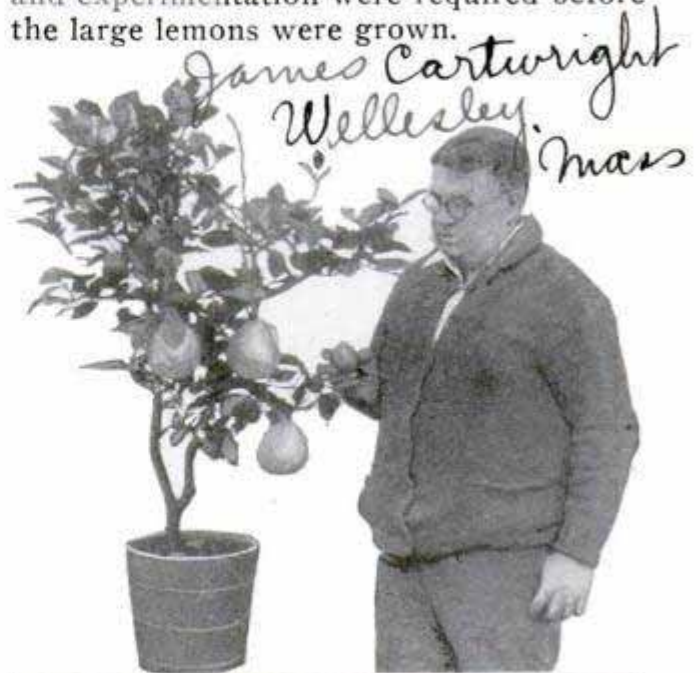
Many persons have noticed that pianos, phonographs, radio sets and other instruments seem to sound better in the room adjacent to that in which they are being played. This has been explained by tests performed by Prof. F. R. Watson, at the University of Illinois. By means of racks of sound-absorbing materials placed in a room where an orchestra was playing, he found that the best results were obtained

when the end of the room occupied by the players was practically bare, while that occupied by the listeners was sound-absorbent. Too many racks close to the music smothered it, giving poor effects and annoying the players, while an entirely bare room caused unpleasant reverberations. It is suggested that the instrument be placed against a nearly blank wall, while the sound-absorbing draperies and other furnishings be farther back where the listeners are likely to sit.

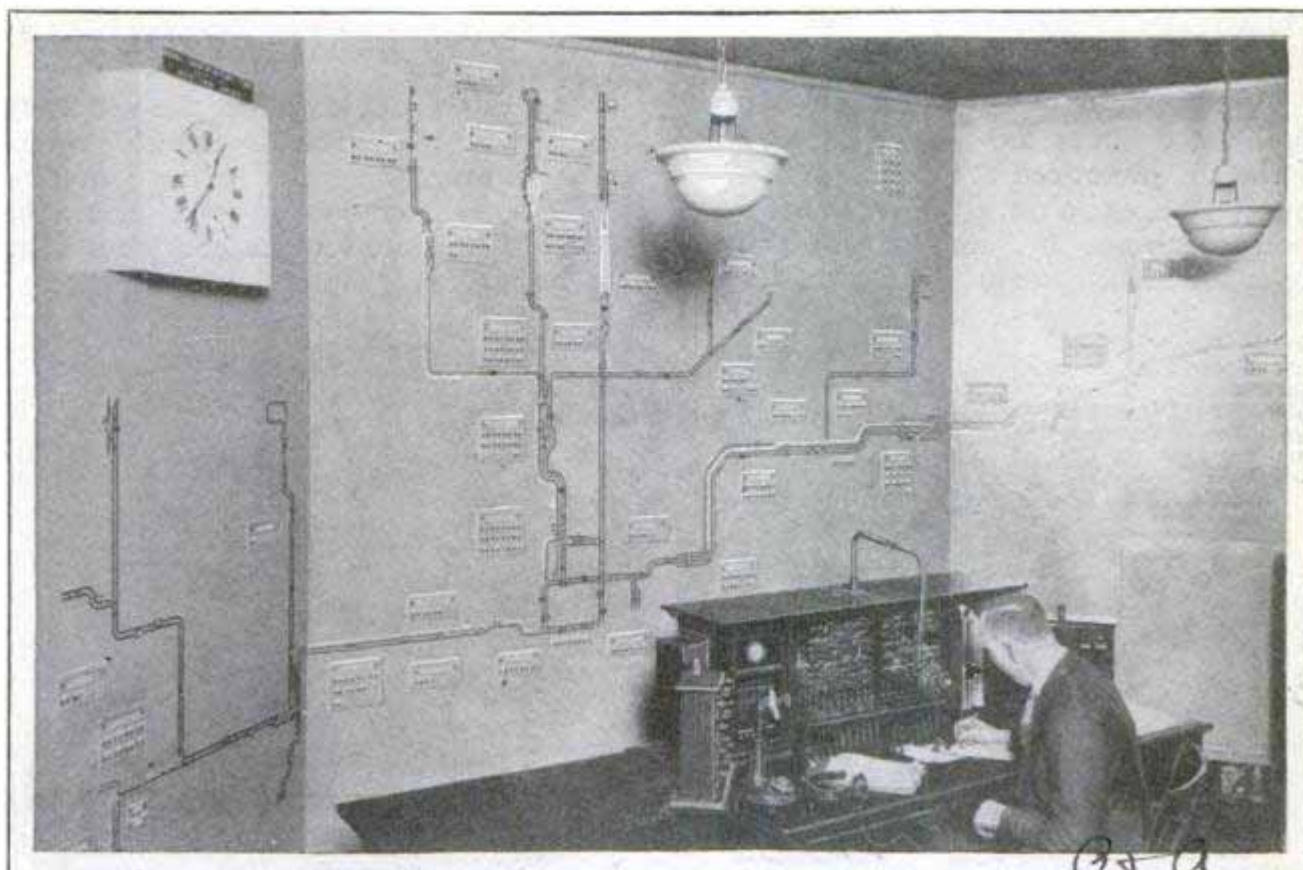
1451 — LARGE-SIZE LEMON RAISED INDOORS

Lemons as large as grapefruit, and weighing between two and one-half and three pounds, have been produced indoors by a Massachusetts naturalist. The size of the fruit

in comparison with the usual market variety is illustrated in the accompanying photograph. Several years of research and experimentation were required before the large lemons were grown.



Huge Lemons and Tree Grown Indoors, the Result of
Careful Selection and Research



In the Power Supervisor's Office of the Chicago Elevated Lines; on the Walls Is a Chart of the Entire System; Tiny Lamps Indicate Conditions on Routes by Day and Night

LIGHTED CHART OF "L" SYSTEM SHOWS FLOW OF POWER

Far from the roar of the trains, a power supervisor superintends the operation of the elevated lines in Chicago, routing electricity instead of cars to insure regular service. To aid him, a chart of the entire system indicates, by tiny red and green lamps, the condition along the routes, the thirty-five power sources and the miles of track. A glance at the map shows the situation at any time of day or night, and by telephone, the supervisor can order instant alterations to meet any emergency.

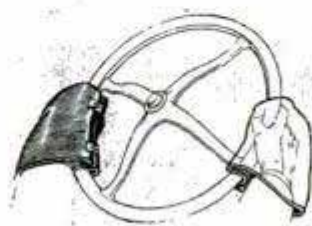
WONDERS OF GRASSHOPPERS

Grasshoppers are more marvelous than men or elephants in many ways, according to Dr. William G. Vinal of the New York state college of forestry. Although the grasshopper has six legs, it never gets them tangled; if a human being could jump with ability in proportion to that of the grasshopper, he could clear the Flat-iron building. The insect is self-made, that is, it does not have the guidance of elders, for it never sees its parents after

it is hatched, and its skeleton is on the outside instead of on the inside of its body, Dr. Vinal states, in mentioning a few of the characteristics of the creature. The naturalist believes that trees, grasses, rocks, water and other things encountered daily, will be as interesting as circus and museum specimens when their wonders are fully known.

HAND WARMERS FOR MOTORIST SNAP ON STEERING WHEEL

Sheepskin driving mitts, lined with fleece and attached to the auto steering wheel so that they cannot slip and the



motorist can withdraw his hand quickly to grasp the brakes, have been introduced. Besides promoting greater safety and comfort, they are designed to outlast an ordinary pair of gloves, as there is less wear and no possibility of catching or tearing. They are easily removed when not needed.

Syracuse University

Superior Products Co. 1228 St. Clair Ave. N. E. Cleveland, Ohio. / Out of business 4/14/27

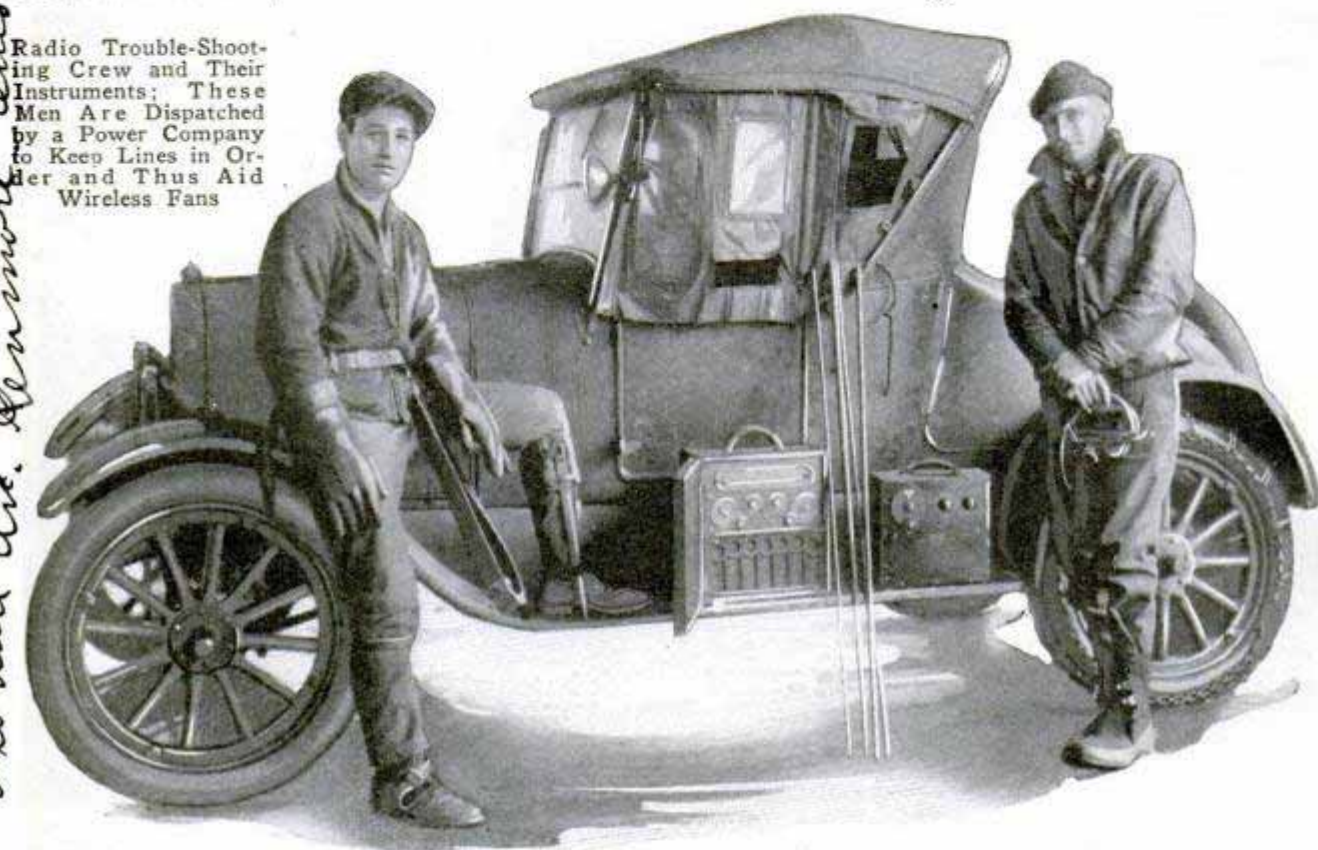
RADIO TROUBLE SHOOTERS SOLVE MANY RIDDLES

A city radio owner turns on his set, and there issues a howl or other noise hitherto unnoticed by him. "Interference!" he exclaims. "There must be a power leak near by," and he rushes to the telephone to complain to the local electric

company. Hence we find the radio trouble shooters among the most overworked men employed by these utilities. The crew usually consists of two men. They are equipped with a light car, portable receiving sets with loops and complete linemen's outfits. On an average, it has been found that in three-fourths of radio-interference complaints, the trouble does not exist, or has disappeared shortly after the complaint was made. Of the remaining troubles, only about one-half are caused directly by electric power lines and equipment. A very small percentage is caused by power leaks. A faulty transformer or other serious trouble in an electric line would be known by the company as soon as by the radio listener. Such trouble, being dangerous and expensive, is remedied at once. What, then, is the cause of radio interference? The trouble shooter has a variety of answers. Atmospheric conditions and static, and fol-

lowing this, trouble within the set itself. If the radio-set owner inspected his equipment before calling the power company, half of the complaints never would be filed. If the interference continues after the aerial and ground leads are discon-

Radio Trouble-Shooting Crew and Their Instruments: These Men Are Dispatched by a Power Company to Keep Lines in Order and Thus Aid Wireless Fans



company. Hence we find the radio trouble shooters among the most overworked men employed by these utilities. The crew usually consists of two men. They are equipped with a light car, portable receiving sets with loops and complete linemen's outfits. On an average, it has been found that in three-fourths of radio-interference complaints, the trouble does not exist, or has disappeared shortly after the complaint was made. Of the remaining troubles, only about one-half are caused directly by electric power lines and equipment. A very small percentage is caused by power leaks. A faulty transformer or other serious trouble in an electric line would be known by the company as soon as by the radio listener. Such trouble, being dangerous and expensive, is remedied at once. What, then, is the cause of radio interference? The trouble shooter has a variety of answers. Atmospheric conditions and static, and fol-

lowing this, trouble within the set itself. If the radio-set owner inspected his equipment before calling the power company, half of the complaints never would be filed. If the interference continues after the aerial and ground leads are discon-

Cash Walter E. Burton 1922
Florida Ave. New York City

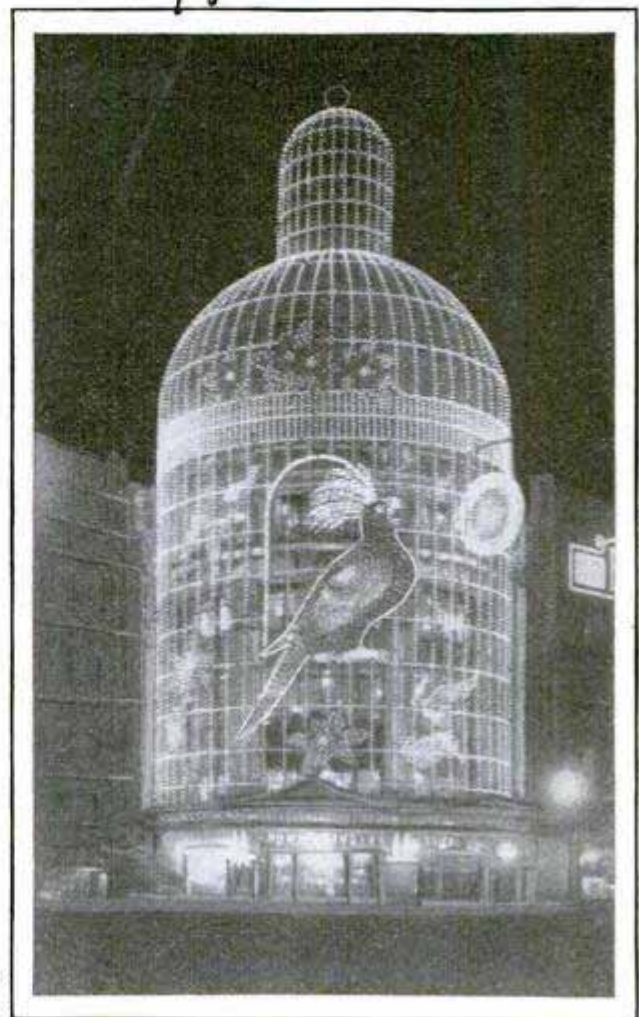
that it was not great enough at first to prevent the light from burning. Nevertheless, the tiny arc created at the break set up oscillations which were heard in radio-receiving sets near the line. Another disturbance started every night at ten o'clock. Several days of investigation revealed that a woman of the neighborhood retired at that time, and turned on an electric bed-warming pad, which had a faulty connection. X-ray machines often are the cause of serious disturbances and battery chargers, oil-heating systems, electric refrigerators, sign flashers, sweepers, bells and buzzers, vibrators, violet-ray machines and brush motors, almost invariably set up oscillations. In fact, every piece of electrical equipment may become a source of annoyance, because defects in connections or wires may develop at any time. Trouble shooters have found that many radio owners think that light-pole transformers cause disturbances by emitting hums. These, however, do not affect radio reception.

ARMLESS ARTIST WINS FAME IN SPIKE OF HANDICAP

Loss of his arms has not prevented William Jones, a California artist, from achieving success at landscape and portrait painting. He has "trained" his artificial members to serve as such efficient substitutes for hands and fingers that his paintings are said to be winning recognition in art salons throughout the country.



Jones Painting at His Easel; Special Clamps Hold the Brushes in Place



Copyright, Herbert Photos

Paris Shop Transformed into Illuminated Birdcage for Holiday Display

"GREAT WHITE WAY" OF PARIS HAS UNIQUE SIGN

One of the brightest electric signs in Paris during the holiday season was an enormous birdcage on the front of a leading department store. It was eight stories high and showed a brightly colored parrot inside. The display transformed the entire building into a huge cage at night.

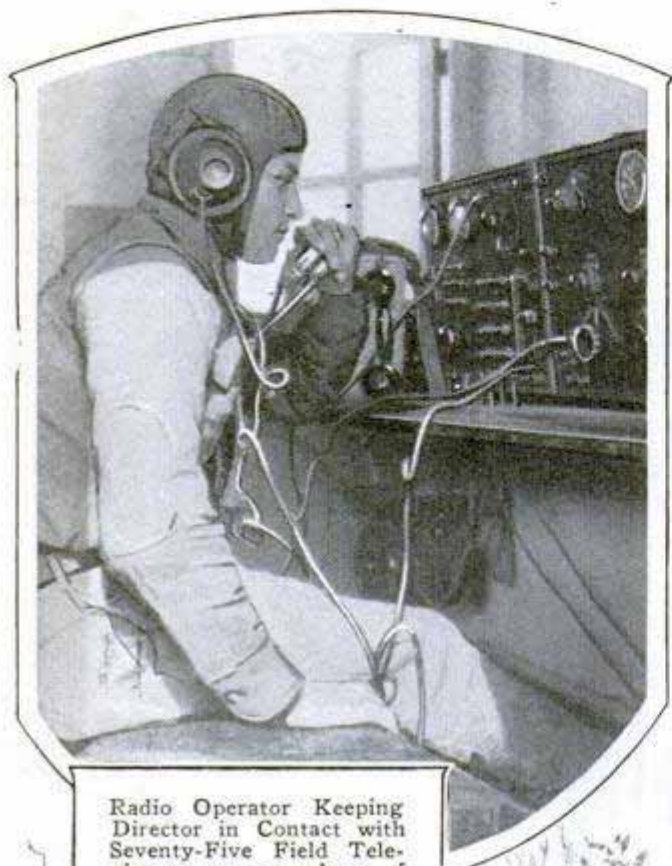
VARNISH COAT GUARDS STONE FROM EFFECTS OF SNOW

Statuary, sundials and other objects of stone or marble can be protected from winter weather by giving them a thin coating of transparent varnish before the cold season starts, a German expert advises. He explains that snow, accumulating on the surfaces, has a tendency to absorb chemicals from the air and disintegrate the material sufficiently to form cracks, in which rains and frost do further damage. The varnish is applied once a year.

1697
Com. George H. Holden Esq.
Highfield View, Tipton

1226

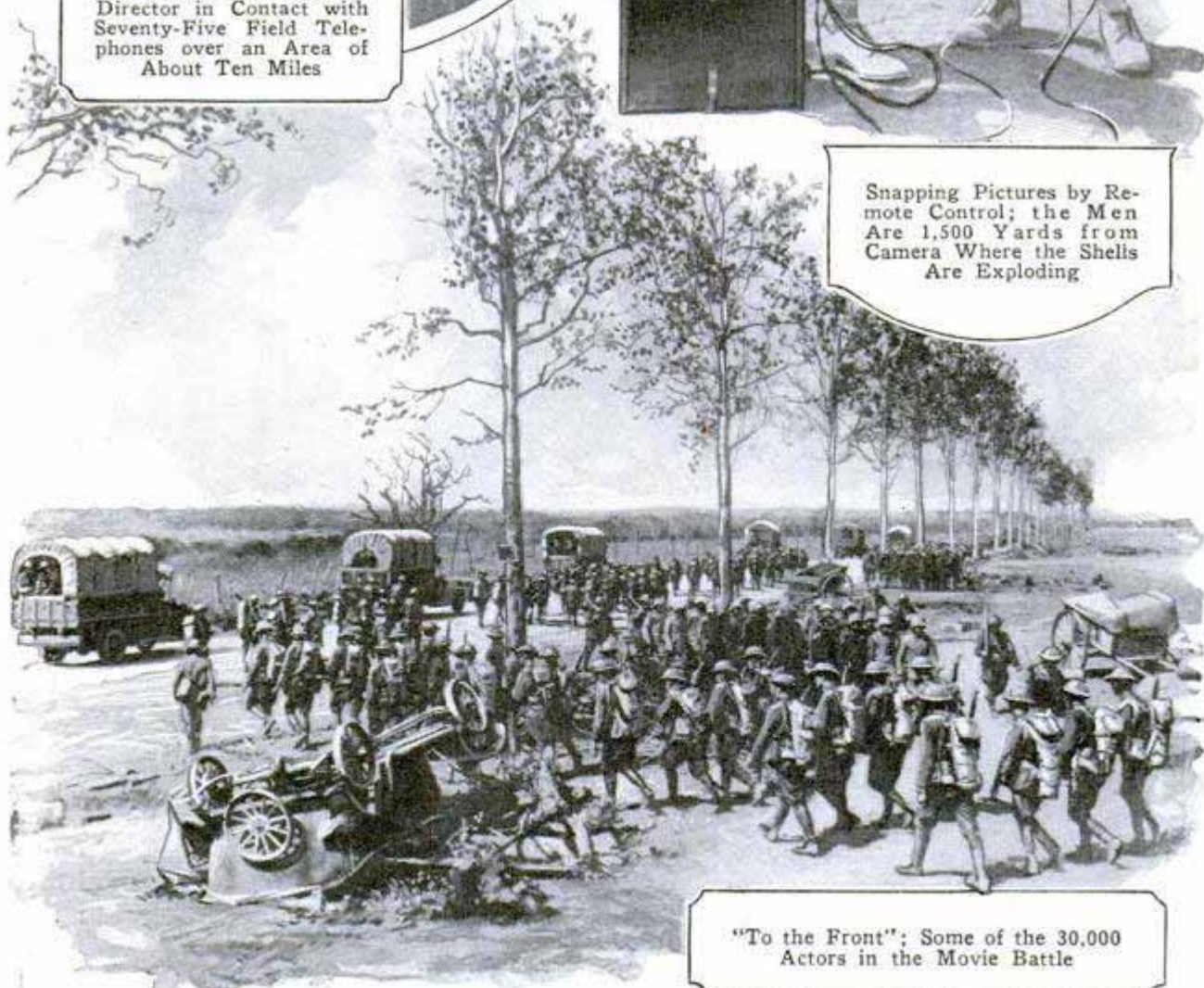
HOW GREAT BATTLE SCENES ARE RE-ENACTED



Radio Operator Keeping Director in Contact with Seventy-Five Field Telephones over an Area of About Ten Miles

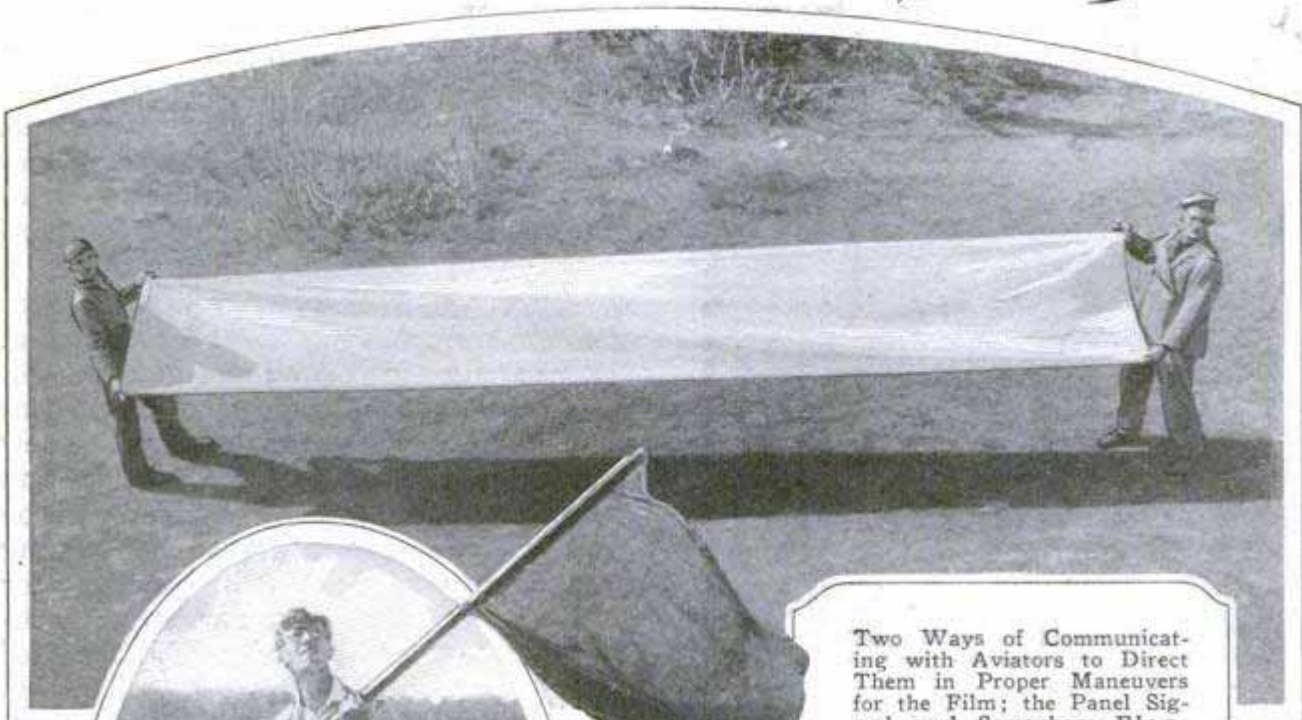


Snapping Pictures by Remote Control; the Men Are 1,500 Yards from Camera Where the Shells Are Exploding

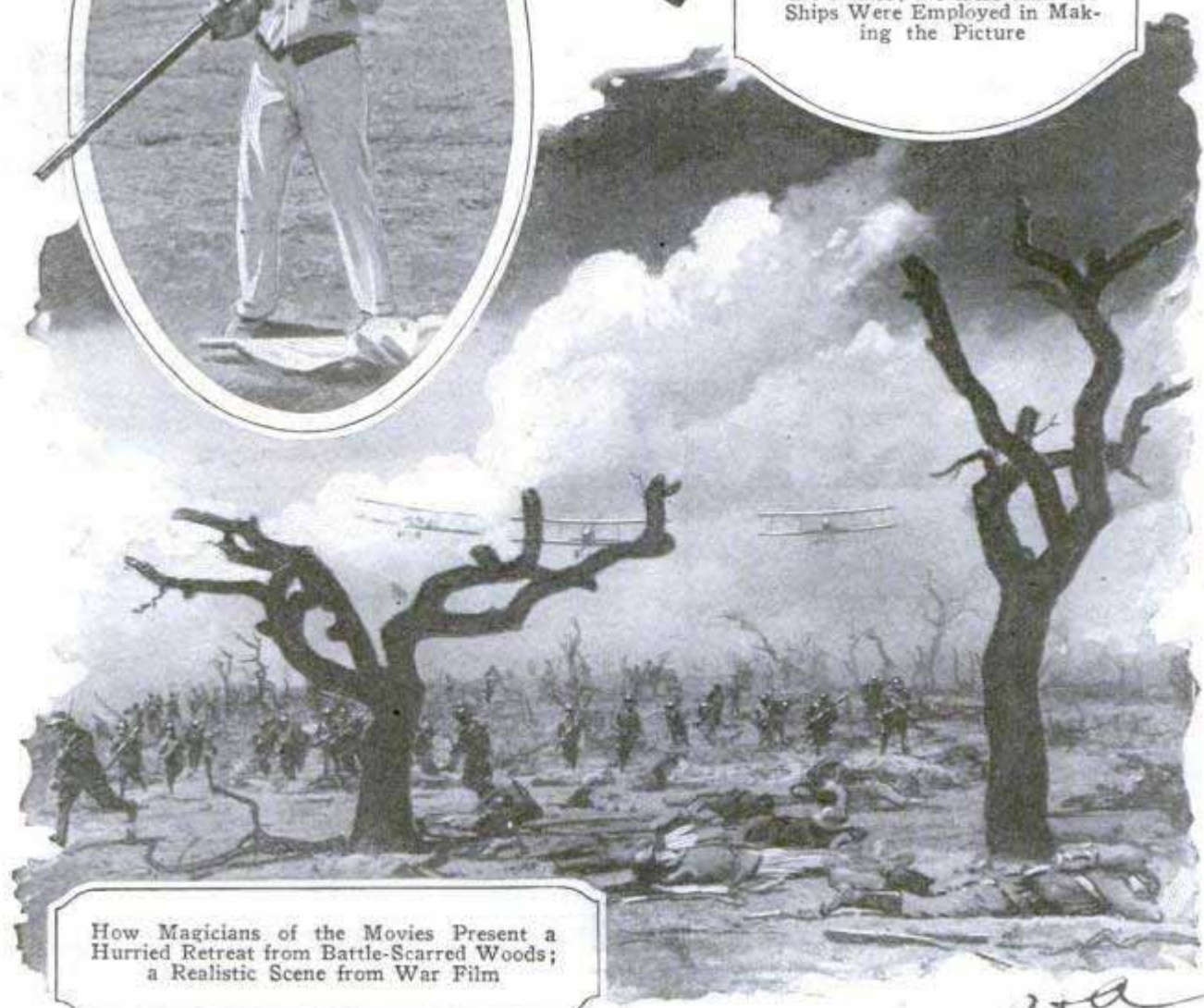


"To the Front": Some of the 30,000 Actors in the Movie Battle

USING THOUSANDS OF MEN IN MOVIE THRILLER



Two Ways of Communicating with Aviators to Direct Them in Proper Maneuvers for the Film; the Panel Signal and Semaphore Flag, Which Help Give Directions to Pilots and Camera Men in the Planes; No Less than 100 Ships Were Employed in Making the Picture

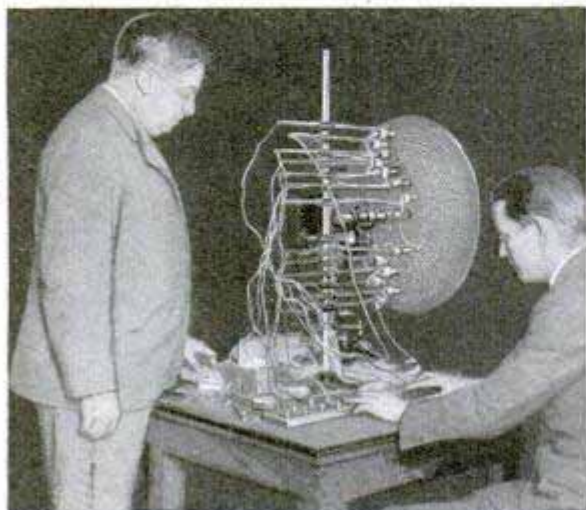


How Magicians of the Movies Present a Hurried Retreat from Battle-Scarred Woods; a Realistic Scene from War Film

gta

TUNES PLAYED BY LIGHT RAYS ON NOVEL INSTRUMENT

Light was converted into sound and made to play tunes in a demonstration be-



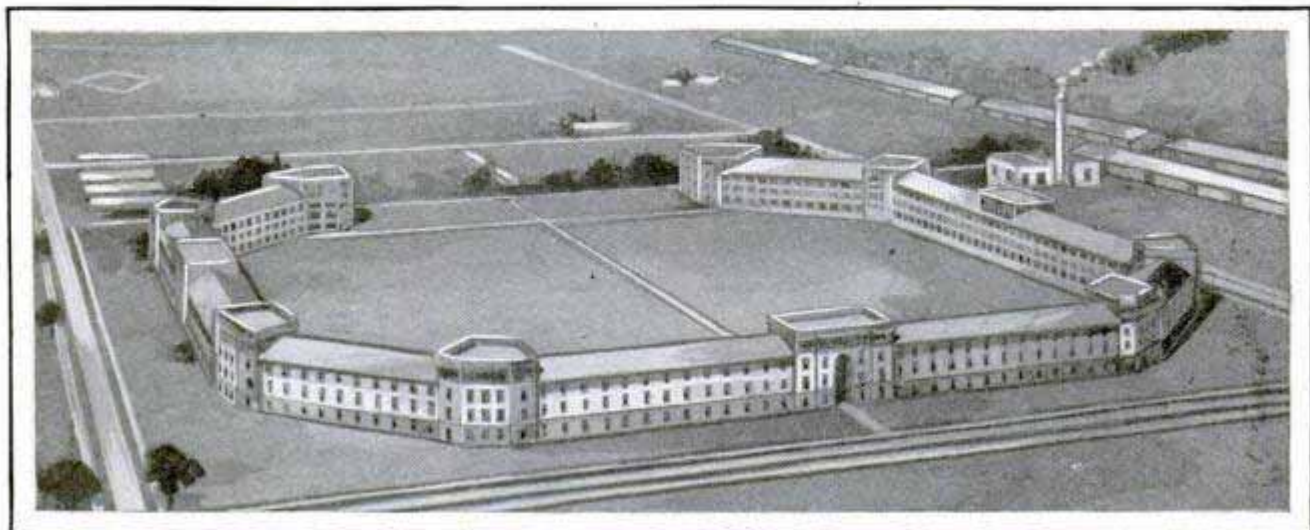
Where Light Rays Play Tunes; Part of the Apparatus for Transforming Illumination into Sound

fore members of the New York electrical society. Rays from small lamps were passed through tiny holes in a rotating metal disk and were transformed into electrical impulses amplified by loud-speaking units. A button control to turn the different lights on and off was provided.

HOME COMFORTS IN BARRACKS FOR ENLISTED MEN

The American army is to have a new roof over its head. The war department has saved enough money from the sale of surplus war properties and congress has

given its approval to using the funds for barracks for enlisted men now living in war-time cantonments, tents and temporary structures. During the past year, 13,644 desertions were caused largely by poor living quarters and scanty rations, Maj. Gen. Summerall, chief of staff, reports. Better housing facilities, he believes, will improve conditions. New construction at seventeen military posts is contemplated at once. Army posts from Camp Lewis, Wash., to Fort Benning, Ga., as well as in Hawaii and Panama will have new buildings to replace the present inadequate non-fireproof shacks. The new barracks will be the last word in utility and comfort. The company houses will be built on the apartment-house plan, giving non-commissioned officers quarters for their families and the unmarried or bachelor private a modern room. The types of buildings planned for Fort Benning, Ga., the army's largest infantry post, will be used as models for the structures at other military establishments. A model barracks has just been completed in part there which eventually will occupy three sides of a huge area. The exteriors of the buildings also will be "localized," that is, in Maryland and other "original" states, the buildings will have a colonial appearance; those in the southwest will be of a mission type, and those of the northwest will represent the early English construction. The two-story fireproof barracks for the enlisted men at each post will contain dormitories, mess and kitchen. The quarters for married non-commissioned officers will be two-family houses.



Model of Improved Army Barracks to Replace Present Inadequate and Unsightly Shacks; While All Will Follow the Same General Plan, Architectural Details Will Vary with Locality

Cuth Emmet Laugherty

Washington

Rack of Steam Domes from Old Locomotives in English Railway Yard; Those Fit for Possible Further Use Are Saved



OLD LOCOMOTIVE DOMES KEPT ON A "HATRACK"

Visitors in the yards of an English railway company see what appears to be an enormous hatrack filled with ponderous headgear shaped like derbies. The articles are steam domes taken from old locomotives. Those that are considered good enough for future use are stored on the rack.

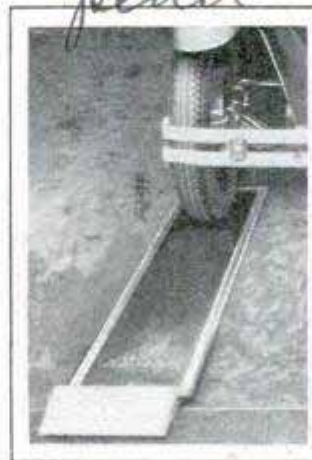
USE OF WASTE PAPER SAVES FIFTY MILLION YEARLY

American industry saves more than \$50,000,000 a year by utilization of waste paper, according to a survey just completed in New York. In that city alone, approximately 5,000 tons of the material is collected and reclaimed each week. Much of it is gathered up by the individual junk man and sold to a large dealer who, in turn, sells it to the paper manufacturer where the process is started all over again. The cycle is so well defined that it is regarded as entirely possible that a man may read his newspaper by the fireside one evening, and six months later go to live in a new building that has his paper inside its walls. One manufacturer wanted

a grayer paper than he had been using. He bought a quantity of old black stockings from his waste-material dealer, mixed them with the paper, and the result was a product of a pleasing mist-gray shade.

TESTER TO ALINE AUTO WHEELS PROLONGS LIFE OF TIRES

Manufacturers declare that more than half of the complaints of poor mileage from tires are traceable to wheels being out of alinement.



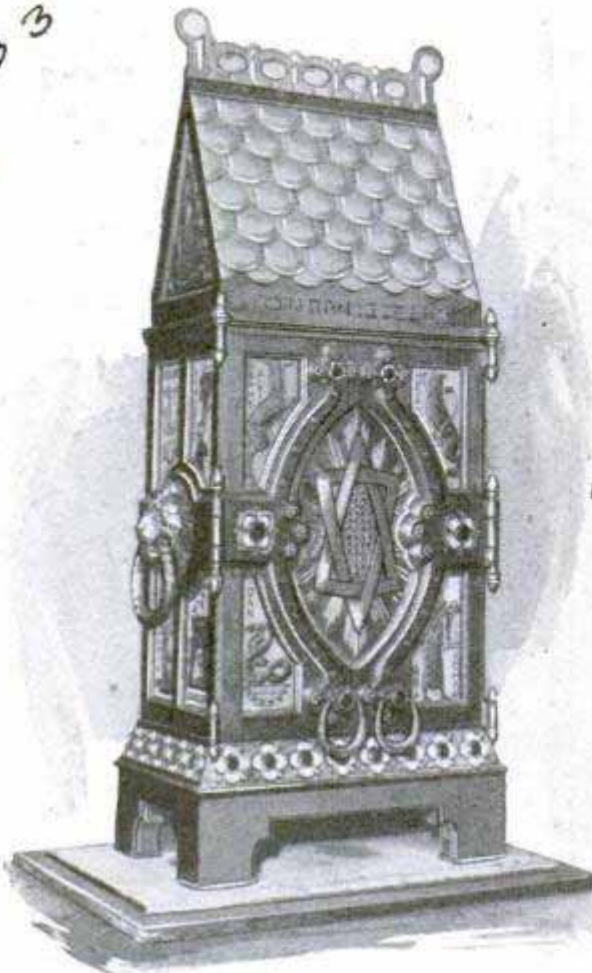
A tester, which quickly tells if the adjustment is accurate or not, has been provided in a simple instrument consisting chiefly of two flat planks one of which slides upon the other. As the auto wheel is run on the tester, an arrow indicator

shows if the alinement is true, or registers the error. The measurements can easily be made for straight driving or on right or left turns.

*Heragen Co.
2124 Hawthorne Ave.
Seattle, Wash.*

*Minneapolis Tribune
2/10/27*

*U.S. Distributors
Motor Wheel Co.*



Replica of Ark of the Covenant for a San Francisco Church, Elaborately Decorated in Bronze and Gold

COPY OF ARK OF THE COVENANT WEIGHS TON AND A HALF

Skilled craftsmen have exerted their best efforts in making a replica of the Ark of the Covenant of Moses' time for a San Francisco church. It weighs about 3,000 pounds, is nine feet high and is elaborately decorated in bronze, gold, colored enamels and old cedar. It was given to the church by a woman in memory of her husband.

PIG FARM IN NEW YORK PARK YIELDS GOOD PROFITS

The sign "Pigs for Sale" greets the visitor in Central park, New York, within walking distance of fashionable Fifth avenue. It is not a joke but an official notice, for pigs are raised and sold at the zoo, and the business has been so successful that it has defrayed the cost of the barnyard, cows, goats, ducks and chickens, according to the keeper.

Ten dollars for a young porker is the prevailing price, and more than 200 of them have passed out of the city's hands into those of private owners. The success of the venture is in harmony with that of the lion production, for more than once the zoo has sold enough lions to help materially in paying the expenses for the entire menagerie.

USE RADIO AS METAL DETECTOR TO FIND BURIED TREASURE

That hidden hoards of pirate gold may yet be brought to light, in spite of lost maps, accumulated sand drifts and other discouragements, has been demonstrated in the finding of a wooden keg of metal loot on the beach of the Gulf of Mexico with the aid of a radio detector. The instrument was successfully used in locating the treasure, which had been hidden by Jean Lafitte, a buccaneer, at the base of an oak tree years ago. It is adjusted to announce, by sounds of varying intensity, the presence and nature of hidden metals. By passing it over the surface, and listening, the user is able to determine to some extent what lies below, since the radio waves respond differently when coming in contact with conducting and non-conducting metals. It is said that the detector is effective to a depth of nine feet.

Price - \$150.00

Will It Reveal the Hiding Places of Buried Pirate Loot? The Radio Detector Which Aids in Finding Metals beneath the Surface of the Ground

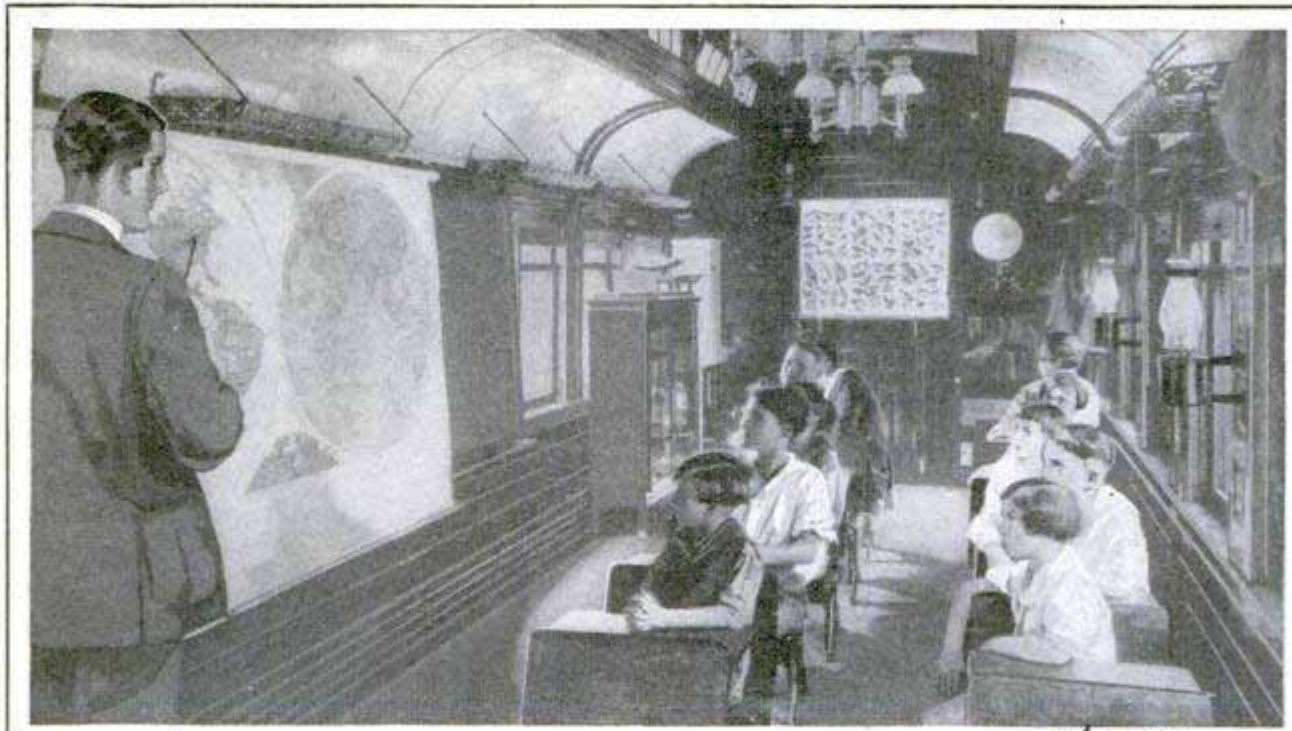


Zoo at 64th St.

Chas. Is O. Maher
Baton Rouge, La.

1033
1657
Ber 966
min. says he has better one
A.A. - delat.
no street address obtainable
0308

Temple Emanuel
Head keeper Coyle



The "Little Red Schoolhouse" on Wheels; Railway Coach Fitted Up as a Traveling Classroom for Teaching Children in Rural Communities; the Canadian Government Maintains Several Such Cars

SCHOOL ON WHEELS IN CANADA SERVES COUNTRY CHILDREN

To some children in the more sparsely settled regions of Canada, the "little red schoolhouse" is a railroad car. The government has fitted up a coach as a classroom with desks, maps and other equipment, and the car is sent out over newly constructed lines of railroad to reach districts where a permanent building has not yet been erected. There is a teacher in charge of each car.

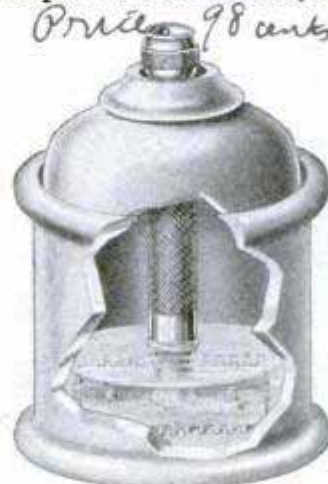
BABIES LESS THAN YEAR OLD SHOW TASTE FOR MUSIC

Some infants may show a preference for different kinds of music even before they are a year old, in the opinion of a mother who has found that the time to teach children appreciation of good music is when they are very young. Instead of singing her babies to sleep, she plays to them and has discovered that pieces of different rhythm and tempo seem to have different effects. One child apparently preferred music of rapid movement, while another evidenced a liking for slower melodies. Five or ten minutes of soft playing usually sufficed to lull the children to sleep and often their crying could be stopped by playing for them. A bit of instrumental

music now and then is good for the children and for the parents, this mother believes, and suggests that radio or phonograph selections of a high order will be as efficient as piano numbers in helping young children gain a liking for music; at least it would be worth trying them if the mother does not play the piano.

BATHTUB FOR SAFETY RAZOR 1741 PREVENTS RUST

To prolong the life of safety-razor blades and to keep them free from rust, they are immersed in a special solution kept in a convenient receptacle so arranged



that the edge of the blade does not come in contact with any hard substance. After shaving, the handle is loosened slightly, the lather rinsed off and the razor placed in the little jar, which is partly filled with the solution. A cover keeps out dust and helps hold the razor in upright position so that the whole of the blade will be immersed.

R 2029
 111 W. Washington, Chicago.
 Northwest Highway,
 Sanders & Co.,
 Factory (5216)
 Price \$1.00

Chicago Evening Post

2/17/27

12 National Kindergarten

1253

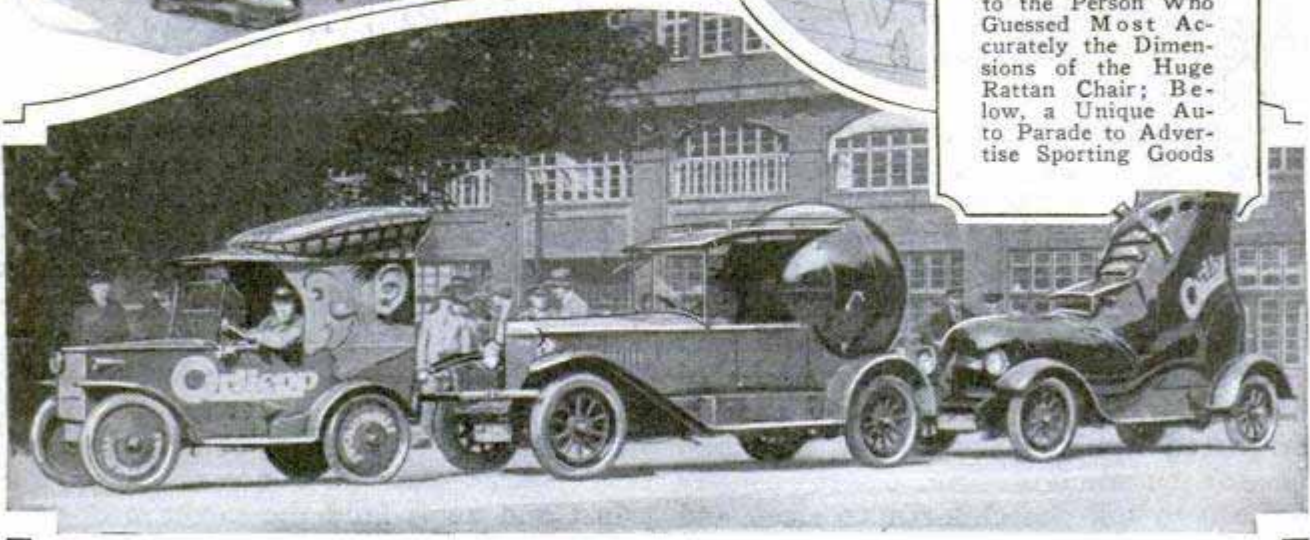
Queer Ways



Stilt Expert Functions as Impressive "Walking Delegate" at Convention; Right, Literally Combing the Streets to Advertise a Firm's Product; the Plan Proved an Effective Substitute for Carrying the Common Lettered Signs



A Prize Was Offered to the Person Who Guessed Most Accurately the Dimensions of the Huge Rattan Chair; Below, a Unique Auto Parade to Advertise Sporting Goods

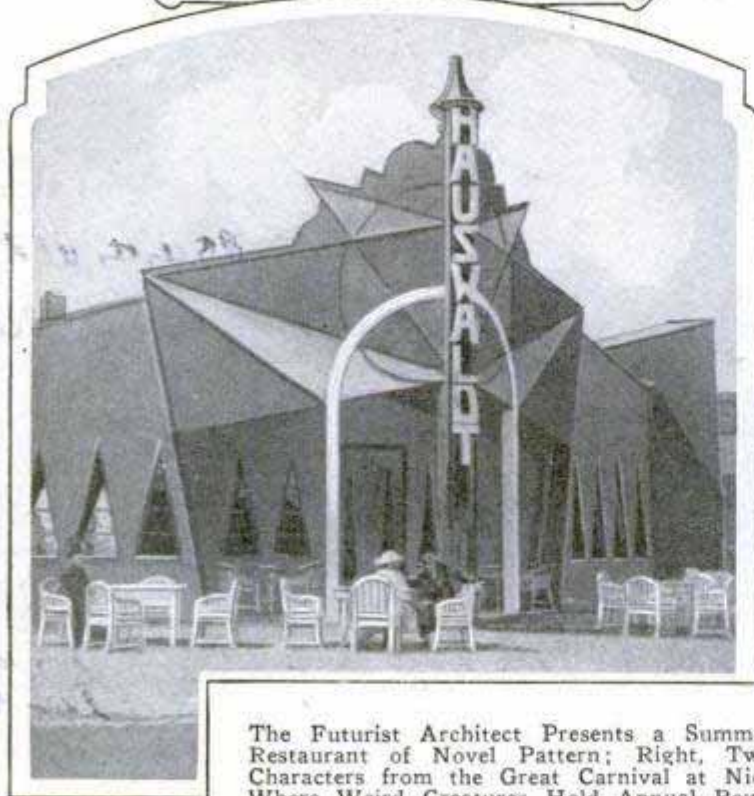


p. a.

of ADVERTISING



Figure of Man Fashioned Entirely from Sponges That Grow in Waters off Florida; Right, an Ancient Auto Featured a Pageant Celebrating a Railway's Electrification to Improve Its Transportation Facilities



The Futurist Architect Presents a Summer Restaurant of Novel Pattern; Right, Two Characters from the Great Carnival at Nice Where Weird Creatures Hold Annual Revel



SIX-FOOT MEASURING ROD COILS INTO VEST-POCKET CASE



Rule in Use, Partly Extended and Coiled in Handy Carrying Case; Its Rigidity Is a Special Feature

Coiled within a small case, about the size of a watch, a steel measuring rule, six feet long, is made ready for use simply by pressure of the finger. The unreleased portion remains in the cup, a simple "brake" device holding the rod to the extension desired. It is said not to kink or tangle, exhibits rigidity even though it is so flexible that it can readily be coiled, and the figures and scale marks are plainly designated in deep blue on a white metallic background so that they can easily be read. A mere push of the rule endwise sends it back into the holder.

HEARTBEAT AMPLIFIED TO ROAR FOR STUDY OF DISEASE

Medical students at the university of Pennsylvania recently heard the throb of the human heart amplified ten billion times through an electrical stethoscope devised especially to aid prospective doctors in diagnosing heart sounds. The

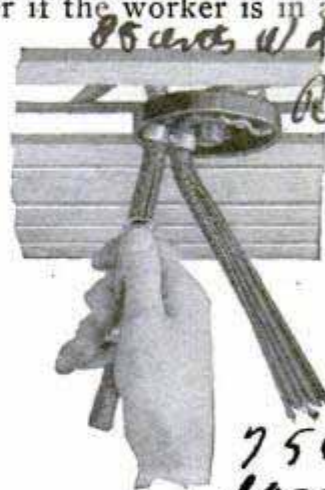
noise was not unlike that of distant thunder according to those who heard it, and the instrument so clearly emphasized the sounds that even lay auditors were able to distinguish the differences in the heartbeats of the eight patients who were tested. The apparatus has been under development for about eight years and this was the first clinical demonstration of it.

DAZZLE MIRRORS TELL AUTOIST TO DIM HEADLIGHTS

Motorists who persist in using brilliant headlights are "given a taste of their own medicine" from a set of mirrors on the windshield of an approaching car. The glasses reflect the glow back into the eyes of the offending driver as an emphatic hint to dim his lights. The mirrors are clamped to the lower half of the shield and are so arranged that they catch practically all of the light and send it back as a single reflection. There are four glasses, all mounted in a single frame, twenty inches long and ten inches high, which is so placed that it does not interfere with the driver's view.

RIPPER TO CUT WIRE SHEATHING SAVES TIME AND WORK

Stripping the insulation from electric wires for battery connections and various installations is not a difficult task, but most novices find that it takes longer than they expect, is troublesome and likely to result in a cut finger if the worker is in a hurry. To simplify this task for the amateur, and the expert as well, a little clamp with a protruding blade inside for ripping the sheathing open has been devised. It is simply applied to the wire, squeezed and pulled, the cutter inside severing the braid with little trouble. There is no danger in handling the tool, as the knife is covered by the other side of the clamp in case the ripper slips off.



75¢ each

Myr. Hiram H. O. ...
Berlin, N. H.
d'Albe, London, Eng
195 Broadway, New York
195 Broadway, New York
and H. J. Hopkins, Laboratory of the Bell Telephone Co.
Test made by Mr C. J. Leambl. M. B. Austin Co.
Pat. 1,212,111

Where Motors Are Winning Favor over Camels and Horses; One of the Sahara-Desert Bus Lines and Load of Eager Passengers; Note the Individual Doors on Lower Deck



MOTOR BUS REPLACING CAMEL —FOR DESERT TRAVEL

Modern motor busses, equipped with endless treads and with a capacity of many persons are appearing in Africa for travel across some of the routes bordering on the Sahara desert. They are supplementing the camel and have become popular with the natives. For long journeys into the interior, camels are still widely used. A "bussoura," or tentlike basket covered with colored cloth and silk trimming, in case the owner can afford such decorations, is securely fastened to the camel's back and has compartments for two persons.

ROCK GAS FOR RUNNING AUTOS REQUIRES NO CARBURETOR

"Liquid" or rock gas, a new by-product in petroleum refining, promises modification of automobile methods, according to reports to a California commission, since it has been used as a fuel without carburetors as well as for lighting. Under pressure, it takes a liquid form and, as such, may be kept in tanks or drums which are attached to the motor vehicle. Released through a petcock, the liquid instantly assumes a gaseous state and will explode

properly on introduction into the cylinder, it is asserted. A drum, one and one-half feet in diameter and four feet long, will hold seventeen gallons of the liquid and weighs, with contents, 120 pounds. It will supply 3,000 cubic feet of gas.

FAMOUS DOG MASCOT STUFFED FOR RED CROSS MUSEUM 1667

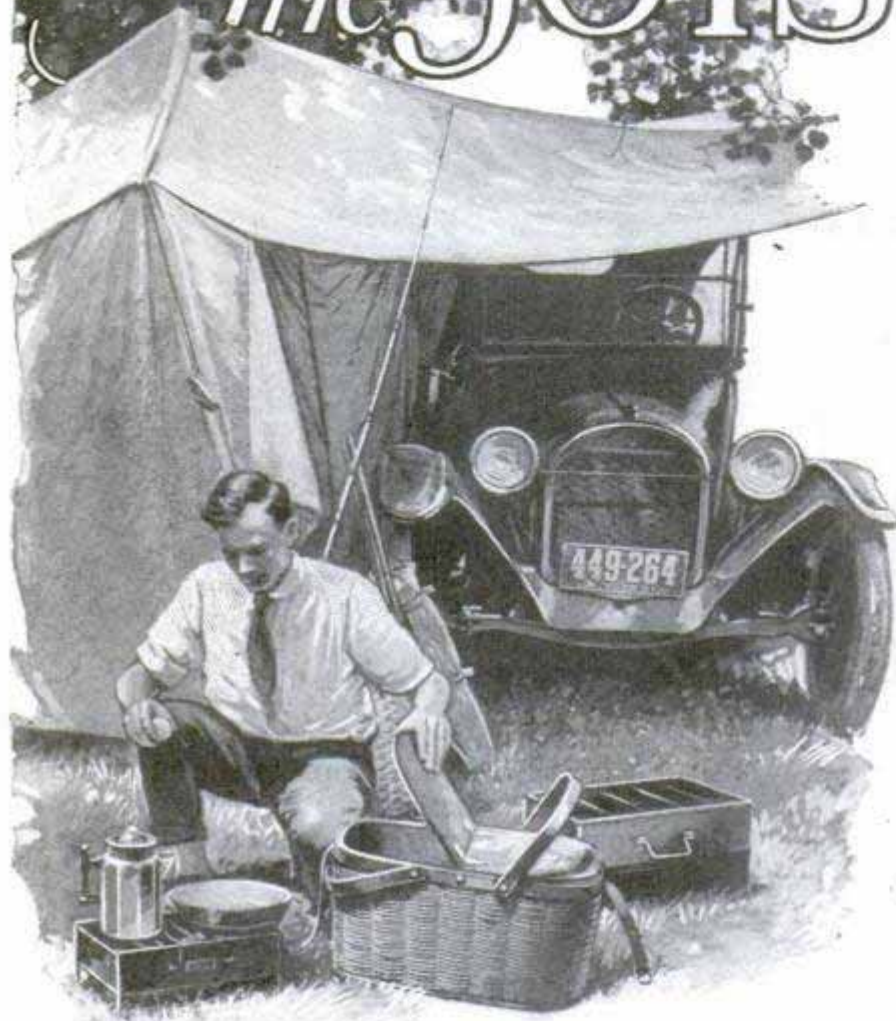
"Stubby," celebrated dog mascot of the A. E. F., has been stuffed and mounted in the American Red Cross museum in Washington, where visitors may see the decorations and wound stripe won by the canine hero during the war. The dog was a veteran of four major engagements.



To Recall a Hero of the War; "Stubby," the Dog Mascot, Mounted in Red Cross Museum

State Railroad

The JOYS of the



A Canvas Tent Built around the Automobile, a Collapsible Gasoline Stove and a Refrigerator Basket Combine the Joys of Home

HO for the joy of the open road! This is the song which more than 5,000,000 auto enthusiasts start singing at the first approach of spring, as then the motor gypsies get ready to sally forth with their outfits. Camping via and in the automobile is the newest and fastest growing outdoor sport, and because it is a heap of fun to play gypsy with a motor car, thousands of families are joining the ranks of the road vagabonds every year. And motor camping is fun with a capital "I," if you like the outdoors and if you have assembled an outfit that makes for comfort.

If you are about to take a plunge into the ranks of the motor campers, here are a few tips on an outfit and how to use it.

First, be sure the car is in good condition and carry a shovel, which will prove invaluable around camp for leveling a piece of ground or for digging a hole to

bury rubbish. And by all means take along thirty feet of new heavy rope for towing purpose. There are so many good tents, so many stoves and camp grates, so many excellent cooking outfits, and other things, that it is puzzling, but the big idea to keep in mind is this: The outfit should be compact and contain few things that are not necessities. The tendency of most motor campers is to carry more equipment than they need.

Let's start with the cooking outfit. Don't select your utensils from the home kitchen because, as a general rule, they won't pack well. The most practical outfit is a single, compact nesting kit, which includes every utensil with each fitting into the other. They

come for two, four and six persons. Also don't forget the long-pronged cooking fork, a pair of big cooking spoons and—last but not least—a pancake turner, can opener, soap dish and dish towels.

In your commissary outfit there is one thing that is strictly taboo. That is, food in paper bags. Try it once and at the end of the day you're apt to find rice, tea, powdered milk, beans and coffee jumbled together. Here are two items you need if you are going into a country where much food will have to be carried: Friction-top tins and waterproof food bags. The first are just what their name implies; tins, with friction leakproof tops. Don't let anyone sell you a frying pan with a non-detachable, protruding handle. For camp use, get a skillet with a detachable handle, which will fold back so that it fits the bottom of the pan.

Private - Auto Used Camp 1379
3120 Millham Road, W.
Kansas City, Mo.

OPEN ROAD



A Complete Traveling Home That Packs Away in the Car; Note the Portable Radio, and beside It a "Desert" Water Bag; on the Running Board Are Spare Cans of Gas, Oil and Water

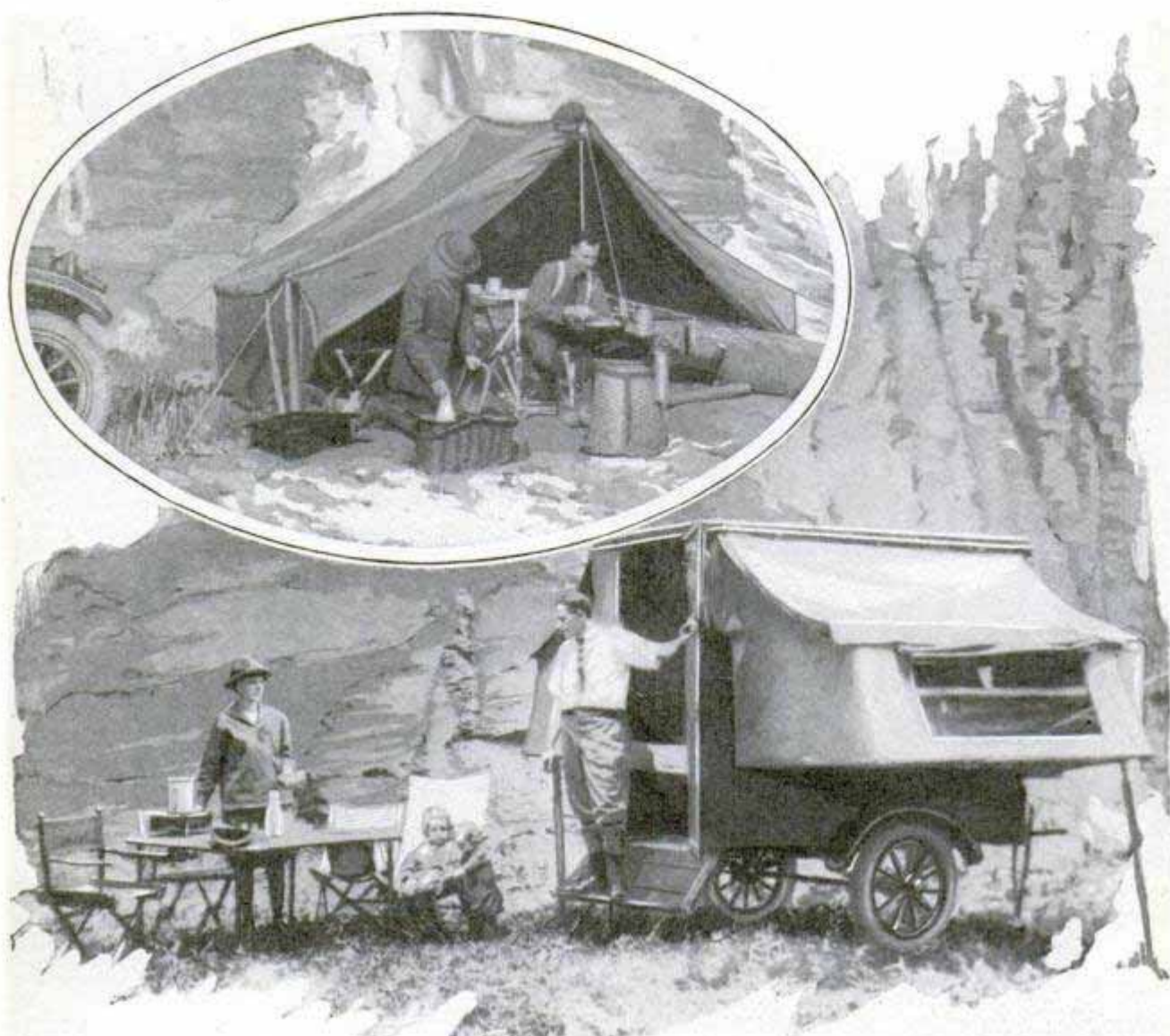
A burner stove of some sort is so convenient that today it is ranked as a necessity. When an old-fashioned downpour is drenching camp, firewood and the entire landscape, you will feel like giving three cheers when the little gasoline stove begins to function. Neat little ovens can be bought to go with them, so that hot biscuits and pies need not be wiped off the menu when you're on a gypsy trail. However, if you prefer a grate and a wood-fire to gasoline, you'll find several types on the market that are satisfactory—and they're inexpensive, too.

When it comes to choosing tent and beds you see how far American manufacturers have gone to give the camper comfort on the road. There are any number of combinations you can work out for your night's sleep. Folding camp cots, air mattresses, filled mattresses, beds in the automobile, poleless tents, tents attached to the car, lean-to type of tents, running-board outfits, wall tents, wedge-shaped tents—you take your pick, keeping in mind your pocketbook and your preferences.

When you buy, make your tent fit this combination: It should be light in weight, simple to erect and comfortable. You will

find many combination beds and tents on the market, but they are not an absolute necessity. The handy, durable folding camp cot has done a great deal to solve the sleeping problem. There are many good points in the cot's favor. For one thing, it lifts the sleeper high and dry above the ground, a location that the average initiate to the camping game likes. Another good point about this article is that it folds up compactly, can be tucked away easily and does not weigh much. Thousands of motor campers use nothing but folding camp cots either of wood or steel frame, and you won't go wrong if you fit your tent with this kind of bedroom furniture. Get one that is thirty-six inches wide and not the regulation army twenty-seven-inch bed. Then there need be no worry about a comfortable night's rest. Only one suggestion about the mattress or slab. Stay away from those made of cotton. They get damp and clammy.

Automobile, tent, beds, bedding, cooking outfit, stove; now camp furniture remains to be considered for your outfit. Very few motor-camping parties need scorn the use of tables and chairs today, because of recent inventions which are



Here Is a Motor-Camping Trailer, a Real Home on Wheels, and, Above, a Light but Very Complete Outfit That Can Be Quickly Erected or Taken Down When Moving Day Comes Around

now on the market. When you go shopping for your outfit you will find a folding table and a roll-top table that are well worth considering. By all means take a table on your trip and also a few folding stools or chairs. A picnic lunch on the ground is enjoyed once in a while, but when you sally forth for several weeks or months to live outdoors, eating on the ground ceases to become a novelty and you welcome chairs and tables.

No matter how "hard-boiled" the motor-camping camper may be, the average touring party likes some sort of provision for carrying perishable food and, when you get on the road, you'll see a number of different kinds of running-board refrigerators. As a matter of fact, if you're going to take the youngsters along, some arrangement for keeping milk cool is a necessity. One of the neatest ice-box outfits on the market is in the shape of a basket. It looks like

an ordinary rattan basket, but it has the insulation that makes it do the trick of "refrigeration." There are two compartments in it, one for ice and one for food. As far as a general food box is concerned, you can buy one or simply take a big bread box and make it serve. Such an arrangement won't handle perishable foods, but it will carry a lot of the essentials. Don't forget to make a waterproof covering for it, so that you can carry it on the running board except when it gets hot.

If you plan to motor camp in the west, there is one article that you ought to include in your outfit. This is a water bag. It is worth its weight in gold to every western traveler. If you can find one that opens all the way across the top, take it in preference to others which have only one small mouthpiece. The wide-open bag is much easier to clean and to fill and, better still, it can be used as a sort of refrigerator.

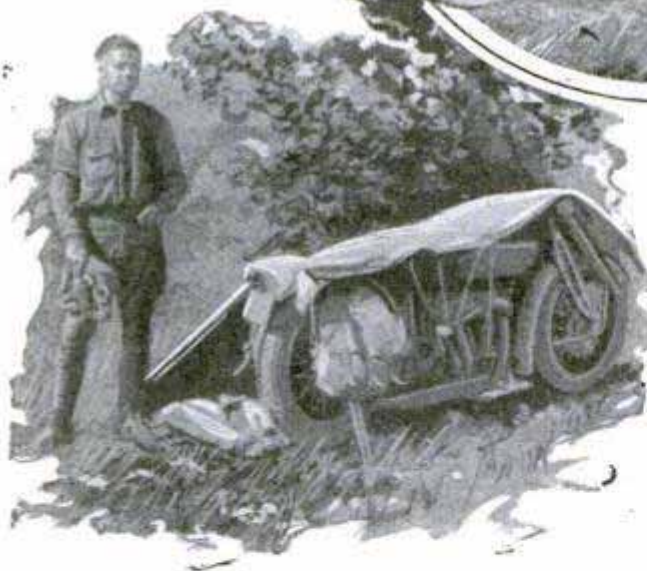
If you want to keep the baby's milk cool, it is possible to drop it in the water bag and let 'er ride, as the water bag is a cooler as well as a container.

There's one item of camp equipment which not one man in a hundred thinks of when he doles out the cash for a motor-camping outfit, but which pays for itself many times before home is reached after a tour. This is the collapsible or folding camp cupboard. This is nothing but a canvas box with several wood shelves. When you hang it up on a tent pole or a tree, the canvas expands to make a neat "storehouse" for food.

No matter how much you hurry in assembling your outfit don't rush the last, and in some respects the most important, of all tasks in preparing for a trip. This is packing the outfit in the car. Find a



Even a Motorcycle Can Carry a Complete Camp Outfit, When It Includes an Army Pup Tent Arranged in This Original Manner, the Idea of a Young Massachusetts School-Teacher



permanent resting place for each item and then pack it in the same place from day to day. In this way you know just where to lay your hand on every piece of equipment. In stowing away your duffle it's a good idea to keep these two things in mind. Do not pack the tonneau so full that the comfort of the passengers is sacrificed and do not put so much on the running boards that the car may be dam-



aged. Somewhere between, there is a happy medium. Every motor camper must work out his own problems, as each has variations in equipment, but the fundamentals are these: comfort of pas-

sengers, equalizing of weight on springs, protection against weather and easy running conditions for the car. You will want a luggage carrier on one running board. Some carry their tent on the side, others in the tonneau, but it can be made up in a small pack and lashed to the little trunk in the rear of the car.

All packs carried on the outside should be wrapped so as to resist water, dust and mud. A sheet of oilcloth, rubberized cloth, waterproof canvas or other such material solves this question. When it comes to economy, ordinary oilcloth can scarcely be surpassed.

Many a motor camper suffers unnecessary discomfort because he doesn't know the ordinary fundamentals of camping. Here are a few things to keep in mind when you select your campsites and prepare to spend one or more days in one place: Avoid sloping ground down which water may run during a rain. Camp on a well-drained site, one that will not be flooded by a



This Small Oven, Fitting over the Portable Gasoline Stove, Makes Pies and Roast Possible at Any Camp Site

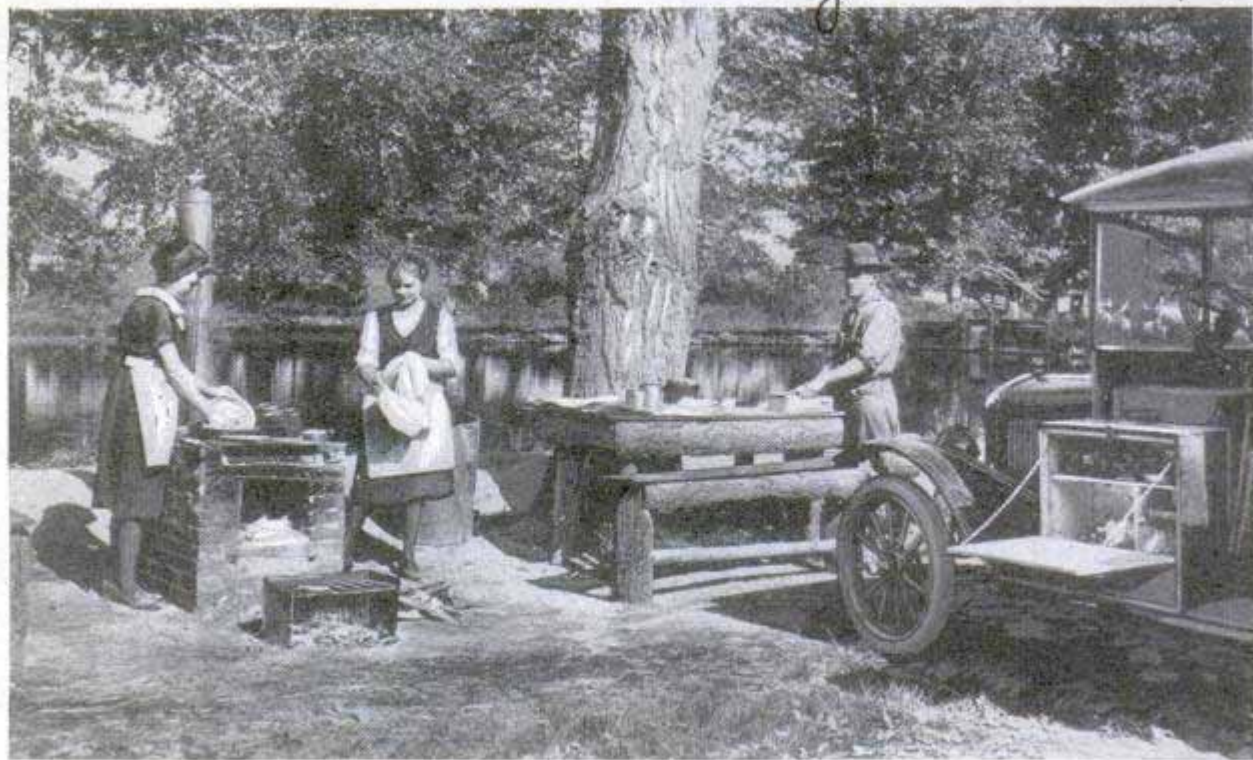
a breeze to keep down the mosquito activities. Don't leave your food or clothing lying around camp at night if you're in the porcupine country. Don't drink from any stream or brook that "looks" pure. The clearest brook may be polluted. When in doubt, boil the water. A place for everything and everything in its place—keep this in mind and camping will be a pleasure instead of a burden and you'll soon be a regular in America's flying squadron of motor gypsies

FISH THAT CATCH AND EAT BIRDS

storm. If possible pitch your tent to face the east or south, the direction away from prevailing storms. If in forested mosquito country, try to avoid a site in dense timber, into which no sunlight can penetrate and through which the breezes cannot blow. You need sunlight for health. You need

Birds that catch fish are numerous, but the angler fish is said to catch and swallow whole, live diving birds, such as the sea parrot and other kinds. Examination of the fishes' stomachs has shown the birds in a condition which proved, it is said, that they were alive when devoured.

new York Times 12/30/27



Tourists Camping in the Bitterroot National Forest in Montana, Where the Rangers Have Provided Dutch Ovens and Tables and Chairs Made from Logs; There Are Many Camps Like This

CITY TRUCKING BY HORSES CHEAPER THAN BY AUTOS

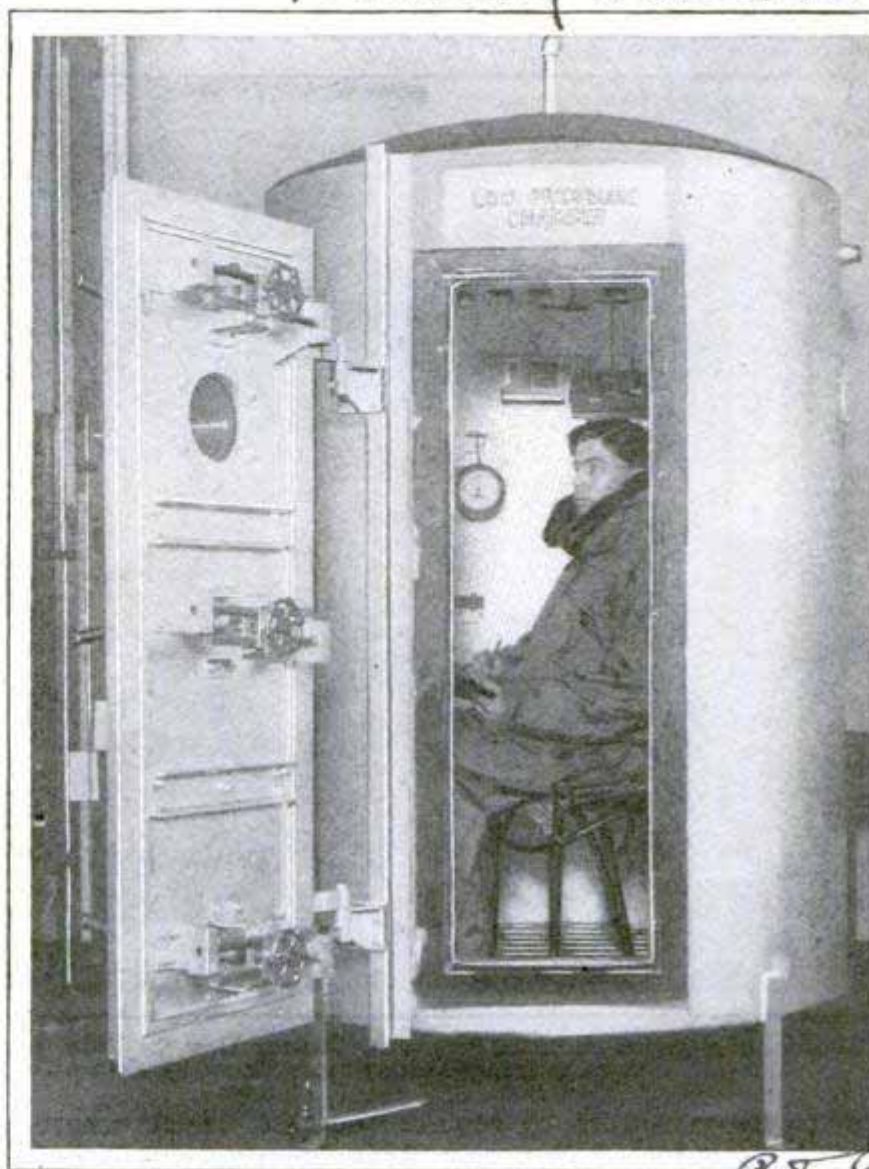
Many persons wonder why so much of the trucking in large cities is still done by horses. The answer is probably found in the statement of an official of a large New York distributing company to the effect that it costs six cents a minute to keep a big auto truck in the streets, figuring in depreciation, upkeep and all other items, whereas a two-horse truck with the same hauling capacity, costs less than two cents a minute. Waiting time is the big feature in city delivery business of this kind, charges being fixed, in many instances, not on a mileage but on a time basis. Traffic delays, terminal congestion, loading and unloading, and getting in and out of the vehicle to make separate deliveries, all mean waiting. An automobile truck burns gasoline and uses oil as long as the motor runs, hence one reason for its greater cost of operation over the horse. Animals favored for city trucking are between 1,600 and 2,000 pounds in weight.

POP VALVES FOR AUTO TIRES INSURE RIGHT PRESSURE

To simplify inflating automobile tires to the correct pressure, a valve that blows off when sufficient air has been admitted eliminates the use of a gauge, reduces the danger of blowouts and prolongs the life of the tire. It replaces the ordinary valve-stem cap, is easily screwed on and has an air-tight top for service while running.



Tire Pop Valve Co.,
767-210th St. N. - 1



Where Conditions at High Altitudes Are Duplicated; the Air-Pressure Tank for Examining Aviators and Airplane Instruments

LOW-PRESSURE AIR TANK TESTS AVIATORS AND INSTRUMENTS

Air conditions at altitudes up to 30,000 feet are duplicated in a pressure tank the bureau of standards has devised for testing airplane instruments and flyers. It resembles a safe, has room for two men besides the objects under observation, and control valves are provided whereby the occupants may regulate the pressure, imitating the changing conditions experienced in an ascending airplane.

Popular Mechanics Magazine does not publish the name of the maker or seller of any device described in its pages, but this information is kept on file and may be obtained, free, by addressing our Bureau of Information.

NEW OIL FIELDS ARE FOUND FAR BENEATH OLD

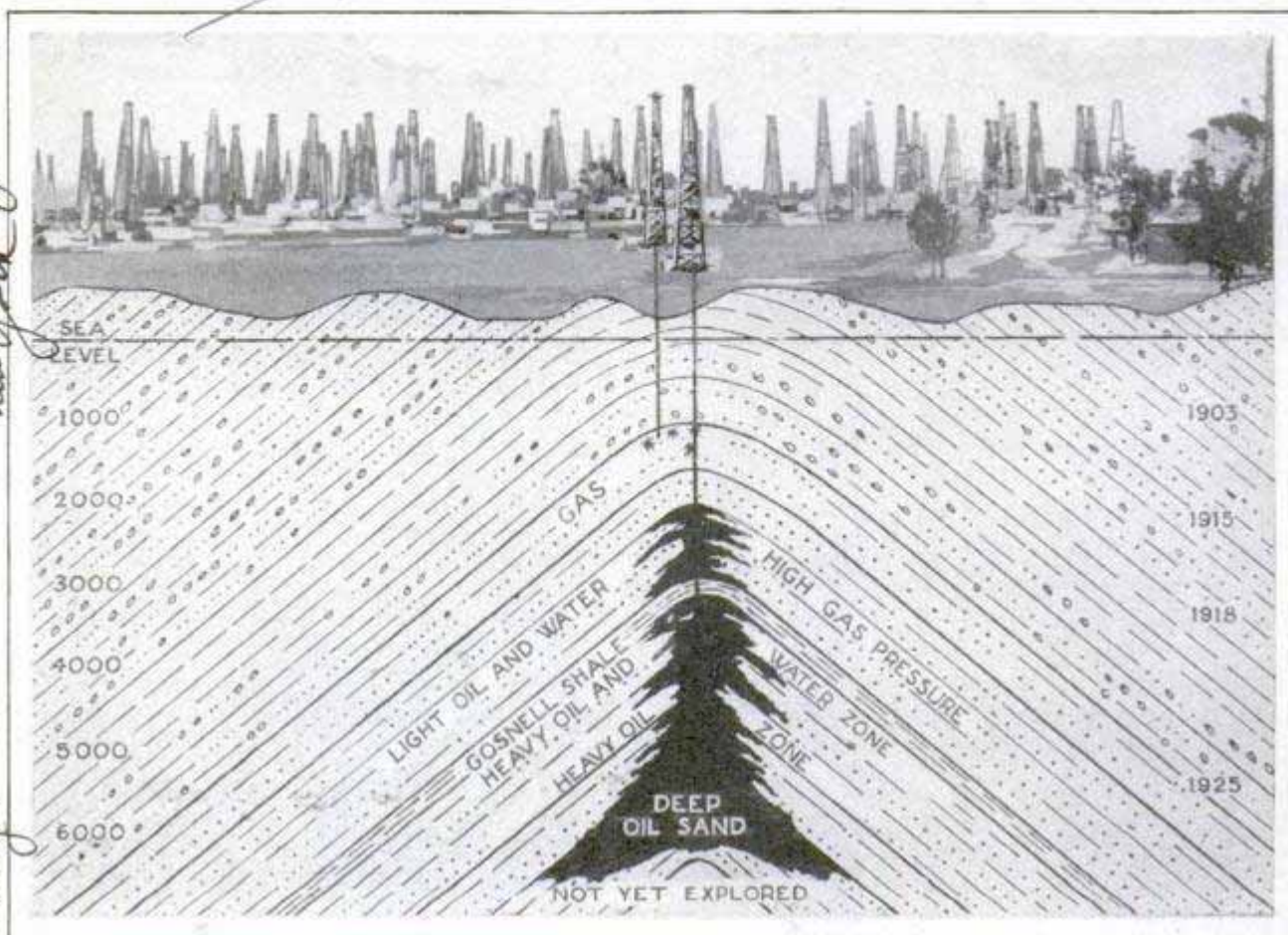


Diagram of a Typical Anticline Formation, Showing How the Rock Strata Are Bent over a Peak, Which Contains the Oil-Bearing Sands Tapped by Modern Deep-Well Methods

New oil resources to replace the fast dwindling fields of the west have been uncovered as the result of the perfection of deep drilling equipment. The Standard Oil company of California recently reported the finding of an immense mile-deep oil bed under a small and worked-out field at Ventura. The old field, brought in at a depth of 2,250 feet, was never a success, running to high gas pressure and water, which produced constant trouble for the drillers. In 1915, when those wells were brought in, that was considered a deep field, but the perfection of rotary drilling equipment since has displaced the old-style cable tools and made two-mile-deep wells possible. The discovery of the new field at a depth of 5,150 feet has been followed by drilling to 6,600 feet, with no bottom to the oil sands yet in sight. A new well has been started and will be sunk until the bottom is reached. This field is in a formation, called an anticline, typical of many oil-bearing strata. The oil is found in the

peak where all the underlying rock has been forced upward by some ancient cataclysm. It is by observing the angles of the rock strata that geologists locate new oil fields with more or less certainty. The original Ventura wells, however, did not owe their discovery to geologists, but to the finding of a gas blowout in an irrigation ditch, and the first wells were sunk for gas. The new field is peculiar in that the deep sands are producing a well of lighter gravity than the upper levels, just the reverse of the usual case. In reporting the new wells, the Standard Oil company bulletin predicted that wells 10,000 to 15,000 feet deep could be expected in the future with the new drilling equipment, and might tap hitherto unsuspected oil reservoirs in the earth.

¶ We want all our readers to write us freely and often whenever they wish additional information on articles published in this magazine. Address Bureau of Information, Popular Mechanics, Chicago.

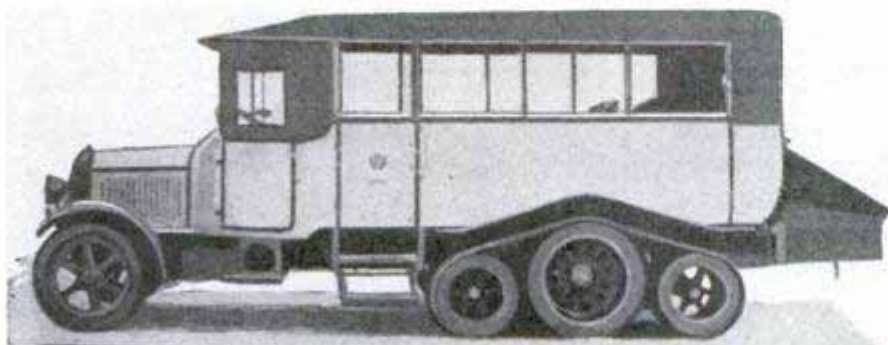
Bulletin Dec. 1926
Probably published at 26 Broadway
New York

WEATHER POSTS IN FAR NORTH AID FORECAST SERVICE

Weather reports are now received twice daily from large areas in Alaska, the Canadian northwest and Greenland. A still greater extension of the service is seen in the proposed railway and telegraph line from Pas, Manitoba, to Port Nelson on Hudson bay. When the wires are up, regular advices of weather conditions will be available from this area, which is visited by some of the most severe cold waves that reach America. Foreknowledge of these conditions would often be of great aid here, weather men suggest. Valuable data have been gathered recently by various airplane expeditions in polar regions and by a research party sent from the university of Michigan.

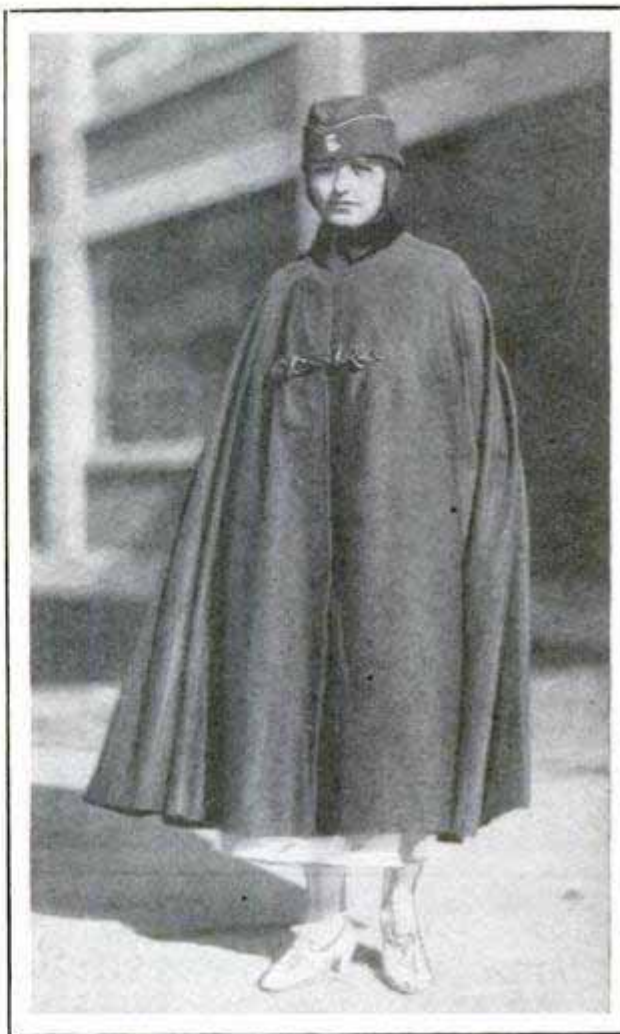
AUTO BUSES CONQUERING ALPS WITH TRACTOR TREADS

The problem of maintaining year-round bus service over the snow-clad mountain roads of Switzerland has been solved by installing caterpillar treads over the rear wheels. The caterpillar unit is unusual in that it does not require removal of the ordinary rear wheels. Auxiliary wheels in front and rear of these wheels carry the tread belt, and pressure of the regular tires on it furnishes the necessary tractive force. In effect, the belt merely lays down a continuous clear roadway underneath the tires, and then picks it up after the wheels have run over it. The novel busses were introduced by the Swiss postal authorities to replace horse-drawn sleds in mail delivery, and, since all the



Caterpillar Bus for All-Year Service over Snow-Clad Alpine Roads; the Regular Wheels Are Not Removed

space was not needed for mail, passenger accommodations were added.



Latest Style in Millinery for the War Nurse; the Warm and Attractive Storm Cap

STORM CAP FOR NAVY NURSES IS WATERPROOF AND WARM

Fashioned after the trench cap worn by the soldiers of the American expeditionary forces, a blue headpiece for nurses in the naval corps is waterproof, and has the insignie of the proper organization embroidered in gold on the front. It was designed especially for nurses on the hospital ships and at naval hospitals in the northern states, to supplement the white-lawn cap worn in the wards, as this was considered a bit too chilly for outdoor use. The beaver hat and white straw sailor, however, are still parts of the nurses' regulation uniform.

One kilowatt-hour of electricity is equivalent to the power exerted by a man in an average day's toil.

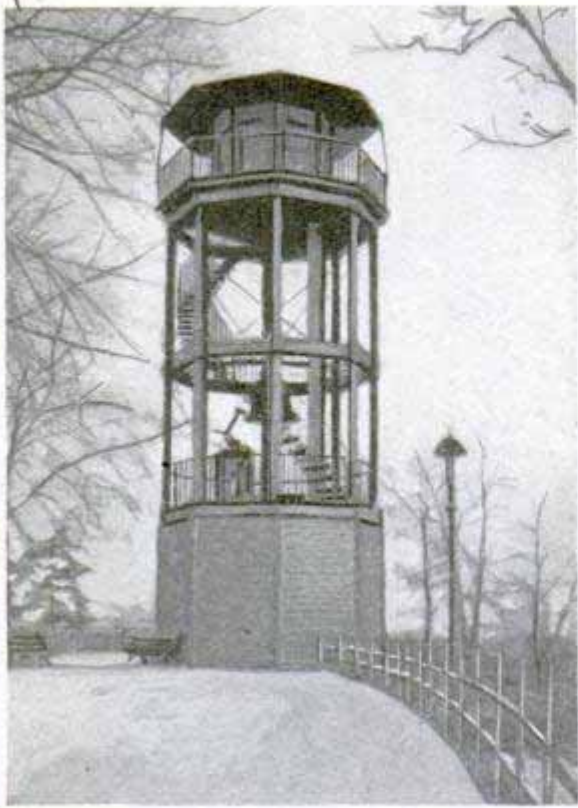
514 W. and Howard Bldg. Washington D.C.
 Encl. Enamel Slaughterby

The motor truck 11/1926

Used by Swiss Postal
authorities

*Machine Co.,
27 Hamrell
Boston, Mass.*

Jackson Polishing Machine



Relic of the Days before Phones, the Old Watch Tower in New York City Park

OLD FIRE-WATCH TOWER SHOWS HOW ALARMS WERE SPREAD

On the crest of the highest point in Mt. Morris park, New York city, stands an old fire-watch tower which was used more than sixty years ago in spreading alarms of conflagrations. The bell and hammer and the platform where the observer stood are about as they were in the old days, giving a picture of conditions before the times of the telephone and modern electric fire-alarm apparatus. Twelve such towers were in use throughout the city in 1865.

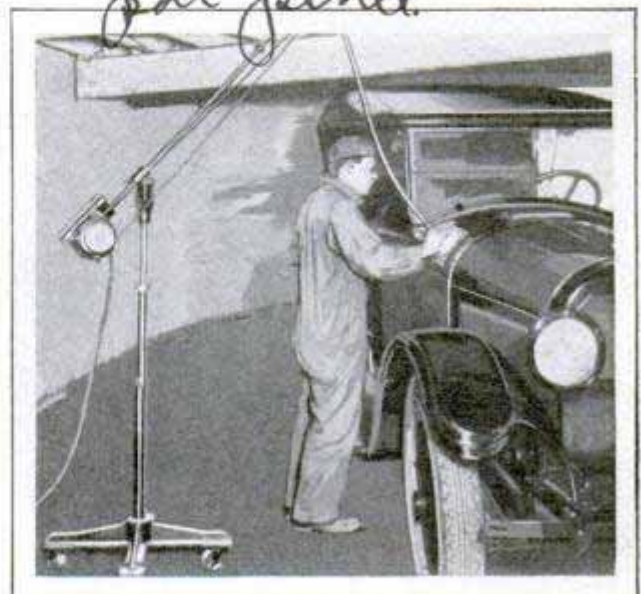
ROMANCE OF LOG TO LUMBER EPIC OF MODERN INDUSTRY

How lumbering has kept pace with other activities in invention and improvement is one of the romances of modern industry. The contrast between primitive operations of a century ago and present methods is strikingly illustrated at Longview, Wash., where a model city has sprung up about a huge lumber plant. Giant logs move up the slips, roll down the decks, are sliced, edged and ripped into boards, carried around the circuit of sorting, stack-

ing, kiln-drying, unstacking, dressing, sorting again, bundling and, finally, shipping. Efficient machines speed the work at every stage. The visitor is impressed by the matchers, a battery of immense, gray-shelled machines into which streams of rough boards are pouring and shooting forth again, beautifully finished and tongued-and-grooved for flooring or other purposes. From each matcher, a trough extends, the flat bottom of which is a speeding belt. It carries the finished stock to the dry chains, where the boards drift past the graders, sorters and bundlers, finally passing down a 200-foot cableway to the dry shed. Huge planers slash the grain down to satin smoothness.

MOTOR-DRIVEN POLISHING PAD 573 SAVES TIME AND LABOR

For sanding, polishing and rubbing a wide variety of surfaces, such as those of an automobile, many kinds of furniture and metal objects, a portable electric rubbing outfit has been devised to improve the quality of the work and simplify the task. It operates through a flexible shaft from a motor, and is so arranged that it treats convex, flat or concave surfaces equally well. The pads are detachable and the instrument is counter-balanced so that it can be used easily with one hand. There are two pads which have a reciprocating movement for wet or dry rubbing. The outfit is furnished for floor or ceiling installation.



Polishing Auto with the Motor-Driven Rubber; It Is Arranged to Shine Flat, Concave or Convex Surfaces

Long-Bell Lumber Co.

*Thompson Polishing Machine
Chas. Bringhamton, N.Y.*

NEW RAY TREATMENT FOR FOOD TO PROMOTE HEALTH

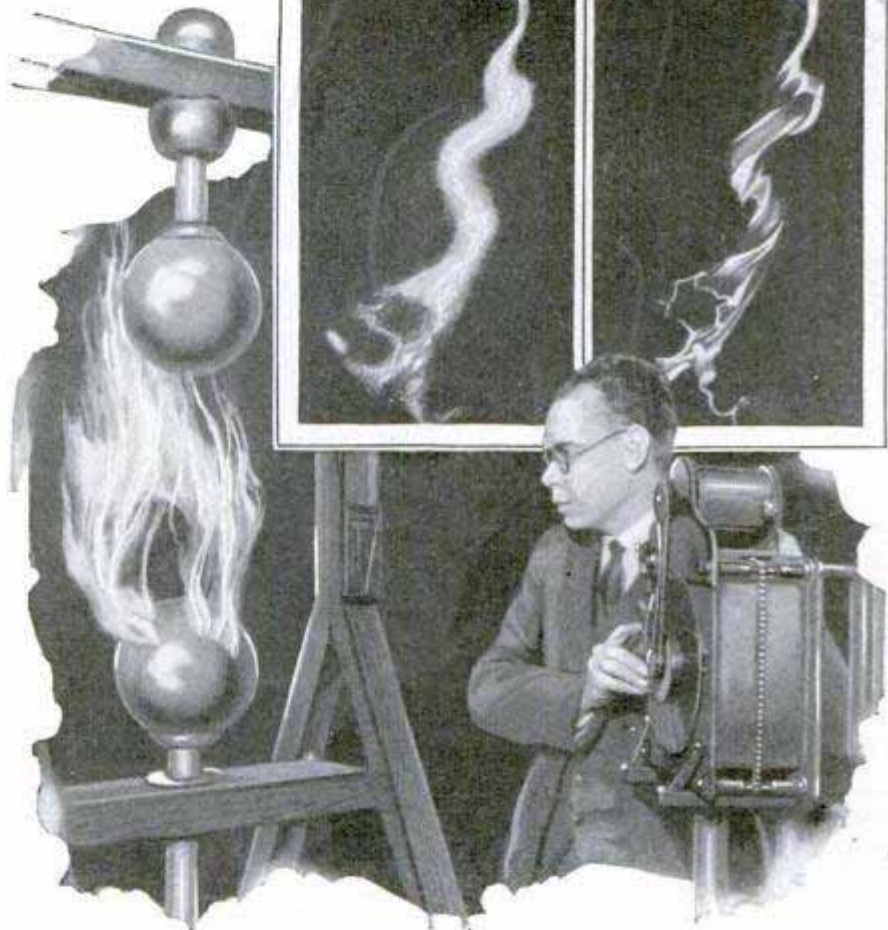
From the chemical laboratory has come another process which promises good for the human race, specifically, greater protection for children against rickets. It is a method for increasing the beneficial qualities of almost all food substances by exposing them to ultraviolet rays under certain conditions, and was developed by Prof. Henry Steenbock, of the university of Wisconsin. He is said to have refused an offer of more than \$2,000,000 for the patent rights, preferring to give the process to the university so that its benefits might be enjoyed without the restrictions of private exploitation. The plan involves using the wholesomeness of sunlight for mankind's table. The life-sustaining ultraviolet rays are transmitted into food from lamps, giving the materials qualities equivalent to those of cod-liver oil, it is said. An essential part of the process is the "capture" of vitamin "D," which enables the human or animal system to absorb from foods and retain sufficient calcium to eliminate all chance of rickets.

Doctors have known for some time that children treated directly with the rays have been helped, and Prof. Steenbock's experiments are regarded as upholding the theory that the great life forces and curative agents of the sun are to be found in its light rather than merely in its heat.

ELECTRIC FLASHES ARE SPIRAL

RAPID CAMERA SHOWS 1704

To the eye, a flash of lightning appears as a jagged, sharp-angled line, but photographs made by a special camera, taking pictures of an experimental flash at the rate of 2,600 a second, indicate that the natural electric spark is an intricate spiral



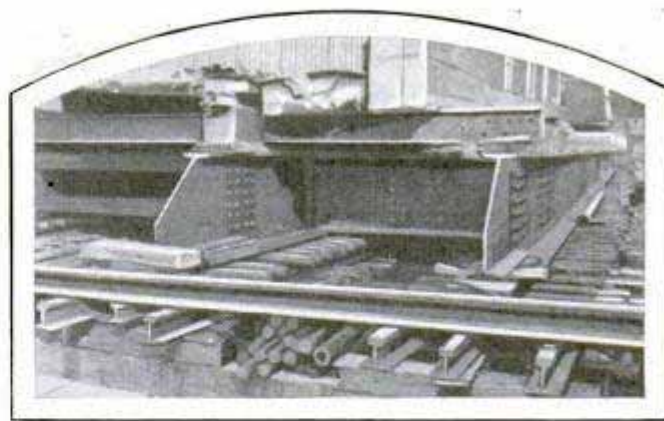
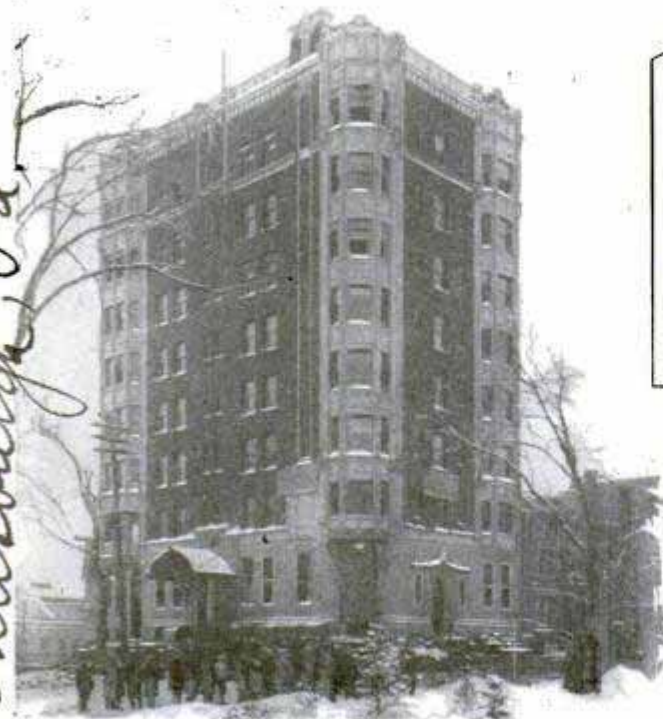
Snapping the Flash with Special Camera, and the Results, in Upper Right; Note the Corkscrewlike Twisting Form

which might be compared with the form of a coiled rope thrown from a height. The sharp, clean-cut effect of the lightning is believed to be an optical illusion. The camera was adjusted to produce a stereoscopic reproduction of the flash, which was artificially formed in the laboratory. The instrument had twenty-two lenses and a high-speed shutter, and several photographs were taken on the same plate, as a single one would not have registered clearly. Apparently, the flashes travel many times the distance of a straight line between beginning and end.

Women members of the Iroquois tribe of Indians held positions as chiefs.

1473
Eichleay Jr. Co.
Pittsburgh, Pa.

John.



The Building after Moving, and Close Views of the Work, Showing the Rollers under the Supports and Teams at the Winches Slowly Pulling the Structure Along

MOVING EIGHT-STORY BUILDING TESTS ENGINEERS' SKILL

House movers again demonstrated the contention that "there is nothing too big to move," when they hauled a 4,000-ton, eight-story apartment building in Albany, N. Y., 400 feet with teams of horses, jacks and steel rollers. The job was considered especially difficult because of the height of the building, about 125 feet, and the journey had to be made across the old cellars of demolished structures. The work was accomplished without mishap, however, and after the water, gas and light connections had been made, the apartments were ready for rental.

SAILOR'S EYE SAVED BY MAGNET 2. BUILT BY RADIO ADVICE

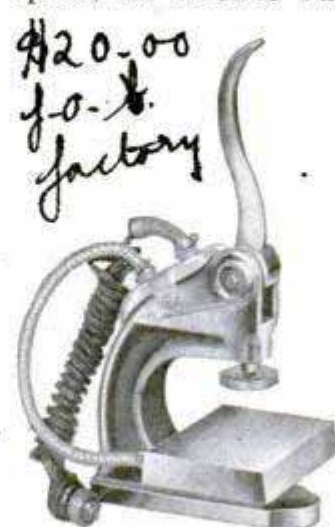
Radio served in two ways recently in removing particles of iron from the eye of a sailor at sea on the freighter "Tomalva." Ordinary remedies had proved unavailing so a wireless message was sent for aid. It reached Dr. Carroll Francis on board the steamer "American Banker." He prescribed a soothing application and use of an electric magnet. "None on ship and don't know how to make one," came the answer. Dr. Francis then sent instruc-

tions by wireless explaining how to construct a magnet by wrapping a bar of soft iron with a coil of wire and charging it with electricity from the ship's radio set. Three hours later, came the report that the iron particles had been removed and the sailor was out of pain.

ELECTRIC TIRE VULCANIZER RUN FROM LIGHTING SOCKET

Requiring but a few inches of bench space, an electric vulcanizer for tire re-

pairing takes current from a lighting socket and is adapted to any tube repair up to three and one-half by five inches. A built-in thermometer eliminates the danger of overheating, and current is turned on and off automatically when the lever is pulled down or up, so that elec-



tricity is not wasted between jobs. Buffing brush and a set of three hardwood pressure blocks of different size are supplied.

ship's surgeon

180

John Hopkins graduate

The All Rite Co.

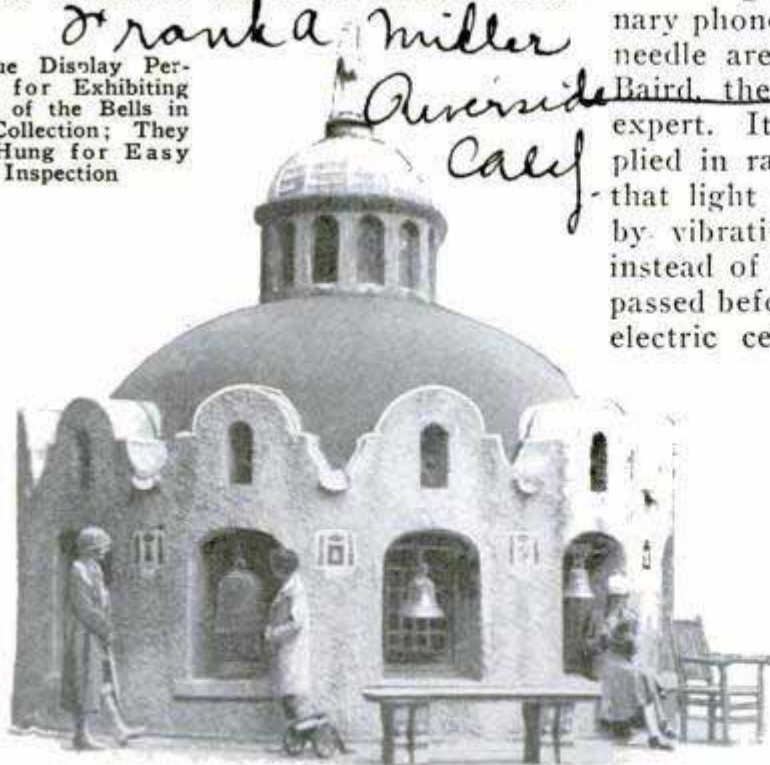
NEW COAL-REFINING PROCESS PROMISES CHEAPER GAS

1795
Rough coal is being turned into highly active carbon by a new method recently developed in Holland. The product assumes three forms, either separately or in combination with each other. These are a dry carbon, suitable for use in many industries such as the manufacture of rubber, ink, sugar, oil and grease; saturated hydrocarbons in liquid condition, said to be better than gasoline for fuel, and gases of high heating value. The method thus suggests the possibility of a simpler and cheaper way of producing gas for towns, especially for the reason that the refining process is reported to be much less complicated than others.

HOBBY OF COLLECTING BELLS AIDS HISTORY STUDENTS

1348
A California man's hobby of collecting bells of historical significance has not only been a source of pleasure to himself but at times has assisted research students, since the legends and data gathered with the bells have considerable bearing on various historical events. Part of the collection has been mounted in a

Unique Display Pergola for Exhibiting Some of the Bells in the Collection; They Are Hung for Easy Inspection



tower and the "Garden of Bells" is a center of interest to many tourists.



Apparatus Used to Reproduce Movies from Sounds Recorded on a Phonograph Record

MOVING PICTURES RECORDED ON PHONOGRAPH

Moving pictures recorded on an ordinary phonograph blank by the usual steel needle are the latest invention of J. L. Baird, the English radio and television expert. It is based on the same fact applied in radio transmission of pictures—that light and sound are both produced by vibrating waves. The actual scene, instead of being photographed on film, is passed before the eye of a sensitive photoelectric cell, which translates the light rays into electric current and this, in turn, is used to operate the needle of the phonograph recorder. When the record is played, the process is reversed, and the vibrations of the needle, traveling over the disk, are turned, first into electrical impulses, and then into light, to be projected on the screen.

■ Making fire by rubbing pieces of wood together seems to have been known by all primitive peoples.

22 First St. London, W.1. Eng.



An Indian-Made Bucktail Lure in the Hands of the Guide on a Northern Wisconsin Fishermen's Paradise

The HOW and

By BOB BECKER,

bass, probably the most popular game fish in America, is a typical species on which to practice this rule. The large-mouth bass is a fish that likes lily pads, rushes, tules and other cover in fairly shallow water along shore. It thrives in lakes with shorelines clogged with old stumps, logs, fallen trees or other similar shelter. This preference holds good for the southern large mouth and the northern. Both love to browse around in fairly shallow water before the hot weather sends them into deeper, cooler water.

Knowing this habit of the scrappy large mouth, the wise fisherman, on his first trip around the lake which he is about to fish, uses his

ALTHOUGH there are a few lucky anglers who every year are able to hook and land record fish with nothing more than a horseshoe in their pocket and a smile from "Lady Luck," the fisherman who knows something about the habits of the finny tribes, their preferences for certain foods, depths of water and protective cover is the one who gets the big strings season after season.

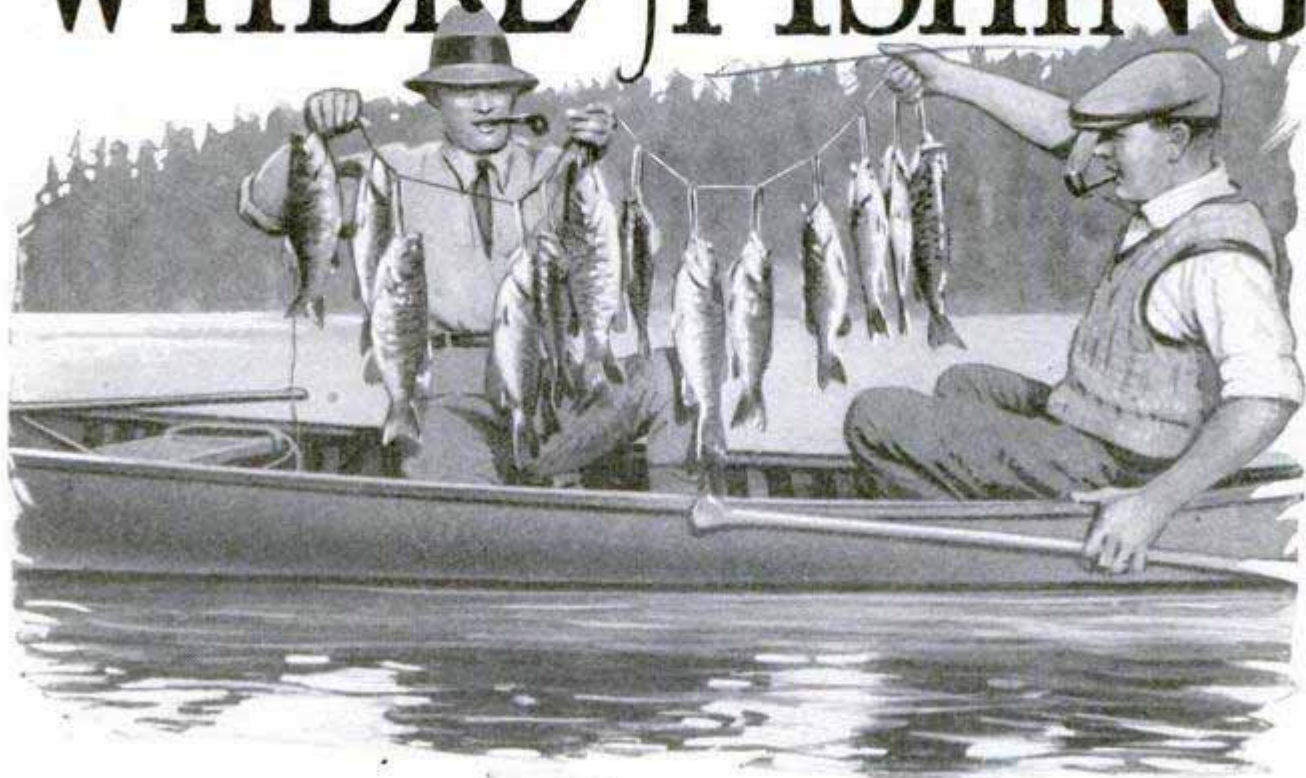
These subjects are especially important to the man who has to take his vacation in July and August. Unless you think "fish style" during these two hot months, they're going to be lean ones for your rod and line. But forgetting for the moment the question of seasons, here are some general tips which the student fisherman should observe when he sallies forth with his weapons.

First, don't waste your time fishing in open water for certain species that spend most of their time in "cover" like weed beds, old snags and stumps. The black

head as well as his rod and line. As a general rule, early morning and late afternoon on through sundown are the best times for fishing as during these periods you find the finny tribes on the hunt for food. But there are exceptions to this principle. For example, take a cloudy, rainy, overcast sky, and you may get sport pretty much throughout the day. This is especially true of brook or rainbow-trout fishing. On bright days, trout often wait until sundown before they begin to feed and strike artificial flies at the same time. And it is easy to see why, too. About sundown there occurs a big hatch of small flies. Sometimes the day's sun brings forth such a hatch in late afternoon. Then the fish feed.

On an average sunshiny, bright day, the small and large-mouth bass are pretty apt to be on the move early in the morning in order to feed on minnows or other natural food. As soon as the sun gets strong, they will invariably leave the

WHERE^{of} FISHING



String of Small-Mouth Bass Taken at Sundown by Fishermen Who Had Studied the Bass' Habits and Knew Just Where to Drop a Line to Find Them Out and Ready to Bite

"lunch counters," and it takes a lot of teasing to get them to bite. Late afternoon, with shadows getting long and the air cooler, you are pretty sure to find them in the shallows, taking their toll from schools of small fish.

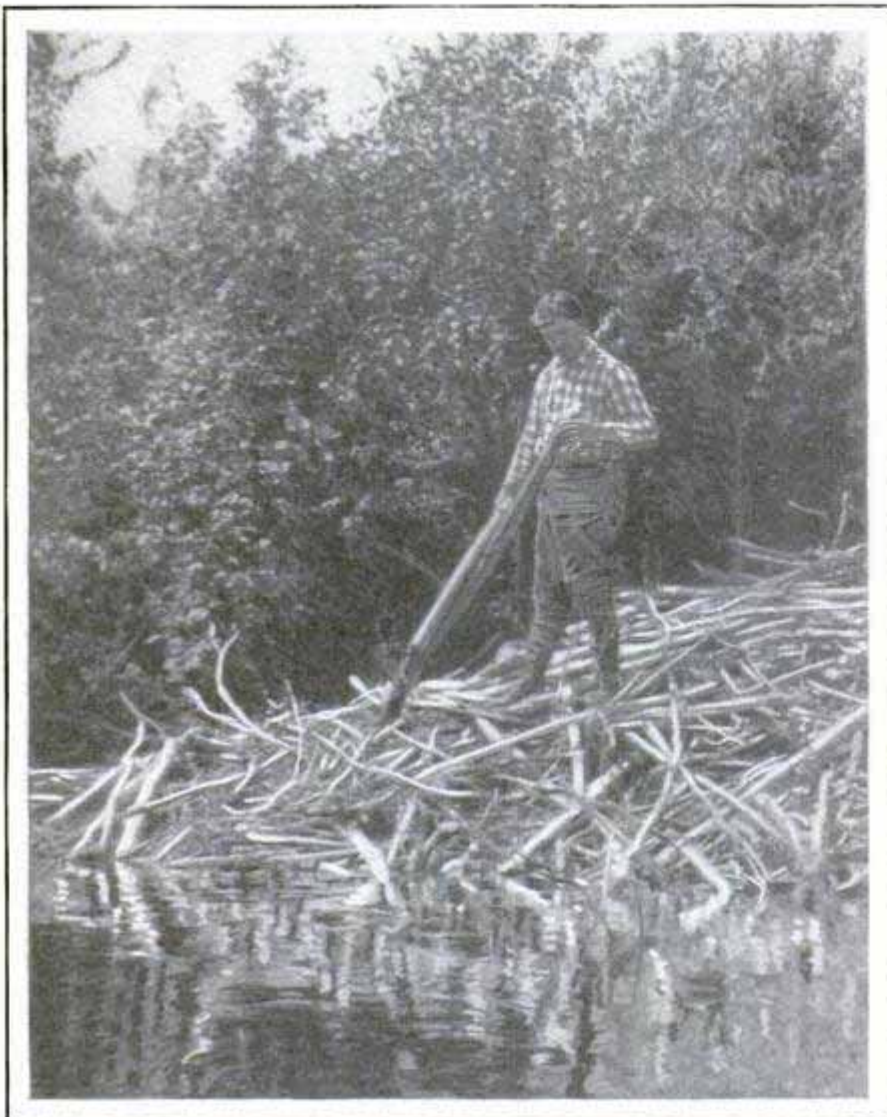
The wise fisherman doesn't push mid-day fishing too hard during the hot summer months, unless he strikes an overcast, misty or cloudy day. However, the big fellows can be tempted at times even during the hot period. It is a known fact that bass seek the deep cool holes in hot weather, so leave the shoreline casting to the other fellow when the temperature is high. He can whip the shallow water to a white foam with but meager results as the old lunkers with moss on their backs have bored down deep.

But, how do you know where the holes are? Two ways to locate them are offered. First, get a guide who knows the lake. The second method is to turn explorer and survey the lake with a thermometer, a trick that but few anglers have had the patience to try. Take a small thermometer, tie it to the end of a stout line, attach a heavy chunk of lead

and then drop the outfit to the bottom of the lake, starting in fairly deep water running anywhere from ten to twenty feet. The thermometer should be left on the bottom for a short time until the temperature can register and then hauled up to be read. Naturally, there is a fairly constant average of the temperature until you strike a spring hole. Then the thermometer registers the shock in no uncertain manner.

In such places the bait should be a fair-sized green frog, alive and kicking. Slip two or three small shot into the frog's mouth, hook it through the lips and then let it go. There is only one way that the frog can go and that is down. The shot are just enough ballast to make it sink gradually in spite of its paddling. So down into the cool depths of the spring hole goes this tempting bit of bait. If nothing happens, locate another spring hole with your thermometer and try your luck again.

There is another way to find these bass lying way down deep, and that is by trolling, which gives you a good chance to run into fish that are "laying low" and



Beaver Houses in the Northern Streams Are Often Excellent Fishing Ground, for the Bass Finds a Home in the Sticks

deep, and at the same time it is often the means of locating bars and weed beds which usually mean fish.

Consider the part trolling plays in locating the wall-eyed pike, a minnow eater and pretty much a night feeder. Late in the afternoon and especially about sundown you'll find the voracious pike moving in schools over bars, around the weed beds and anywhere else that a minnow flirts with death. On cloudy days this fish may be active all day. But finding the wall-eyes and all its pals is the first thing on the fishing program. Here is where trolling with proper rig gets results.

At four o'clock you start fishing. You know that pike are apt to be found over a gravelly bar pretty well out in the lake and in about eight or ten feet of water, as this fish, unlike the bass, scorns the lily pads and old logs along shore. But pike are travelers, so the problem is to

find them. Here is where you troll. A wobbly artificial minnowlike bait or a real live shiner is attached to the line. About two and a half feet above the lure you put on a sinker to carry the bait deep, yet the location of the weight will keep the lure above the bottom as you drift along. You cruise around until a strike is felt and a fish caught. One pike strike invariably means more pike around as this species travels in schools. You fish where the first pike was caught and you're likely to get several more.

This was at four o'clock. After dinner you sally forth again for wall-eyes. The inclination is to go back to the same place you fished in the afternoon. But, if there is a broad, extensive and quite shallow rock and gravel bar near the shore, you'll fish such a place during the eve-

ning instead of in eight or ten feet of water. The man who knows something of the habits of wall-eyes will seek this shallow bar, but the fellow who gives no thought to the habits of fish goes to the sunken bar during the evening. The former is the one who gets the fish.

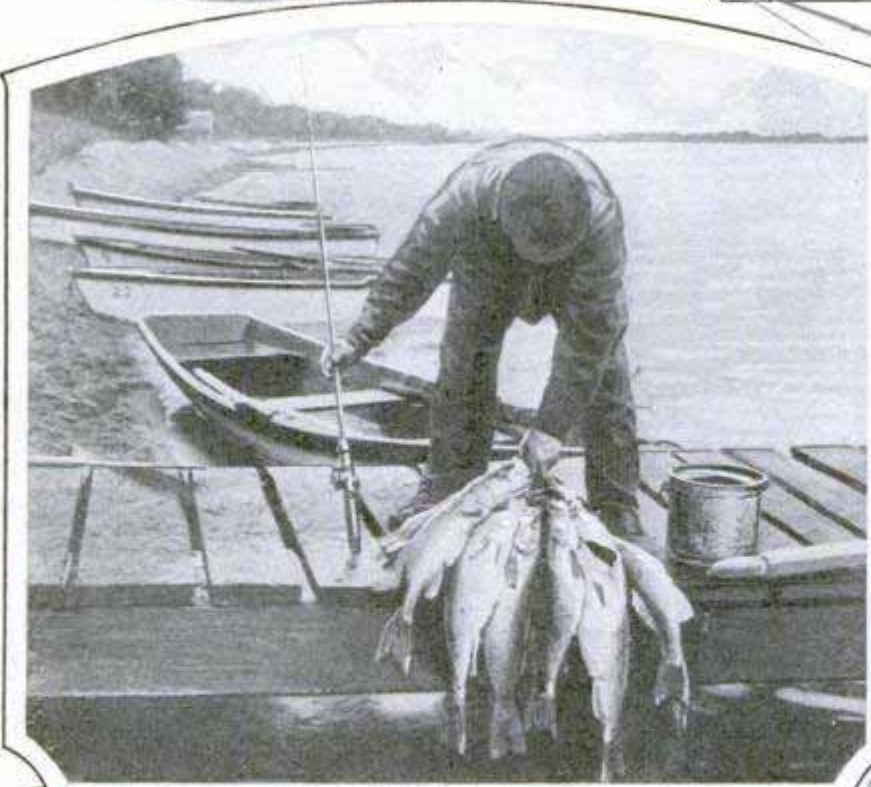
The same thought applies to muskellonge. If the fisherman will tuck away in his mind the fact that the muskie does not travel in schools, does not travel far for food, loves a "hang-out" around a weed bed or beside a log or in a pool below a rapids, and will take time to look over each site, he soon stores up a fund of information that can be put to work on each fishing trip. A flashing whirling spoon lure in front of a bucktail is a killing muskie rig.

Night fishing, when the moon is on the job, is more or less a neglected but profitable form of angling. Think in terms of

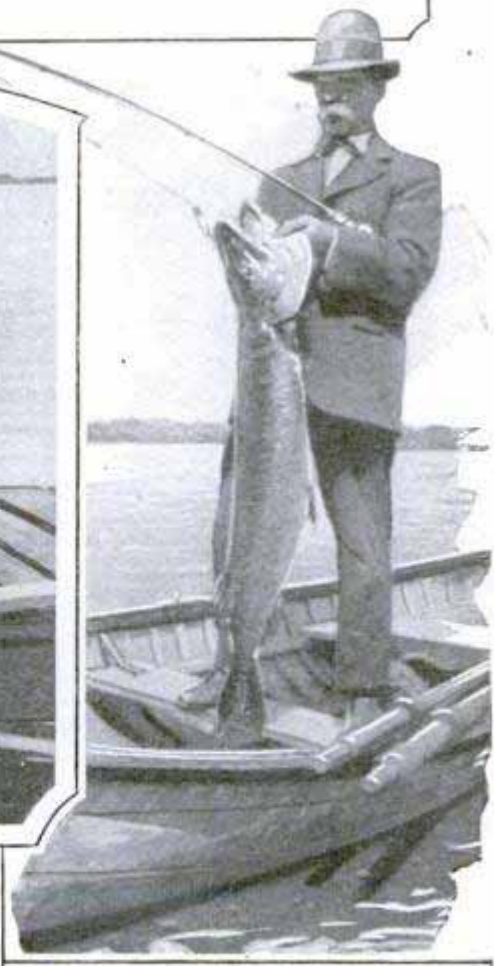
A King of Is-
tolspoga, a Ten
and a Half Pound
Southern Bass,
Taken by Same
Methods as Its
Northern Cousin

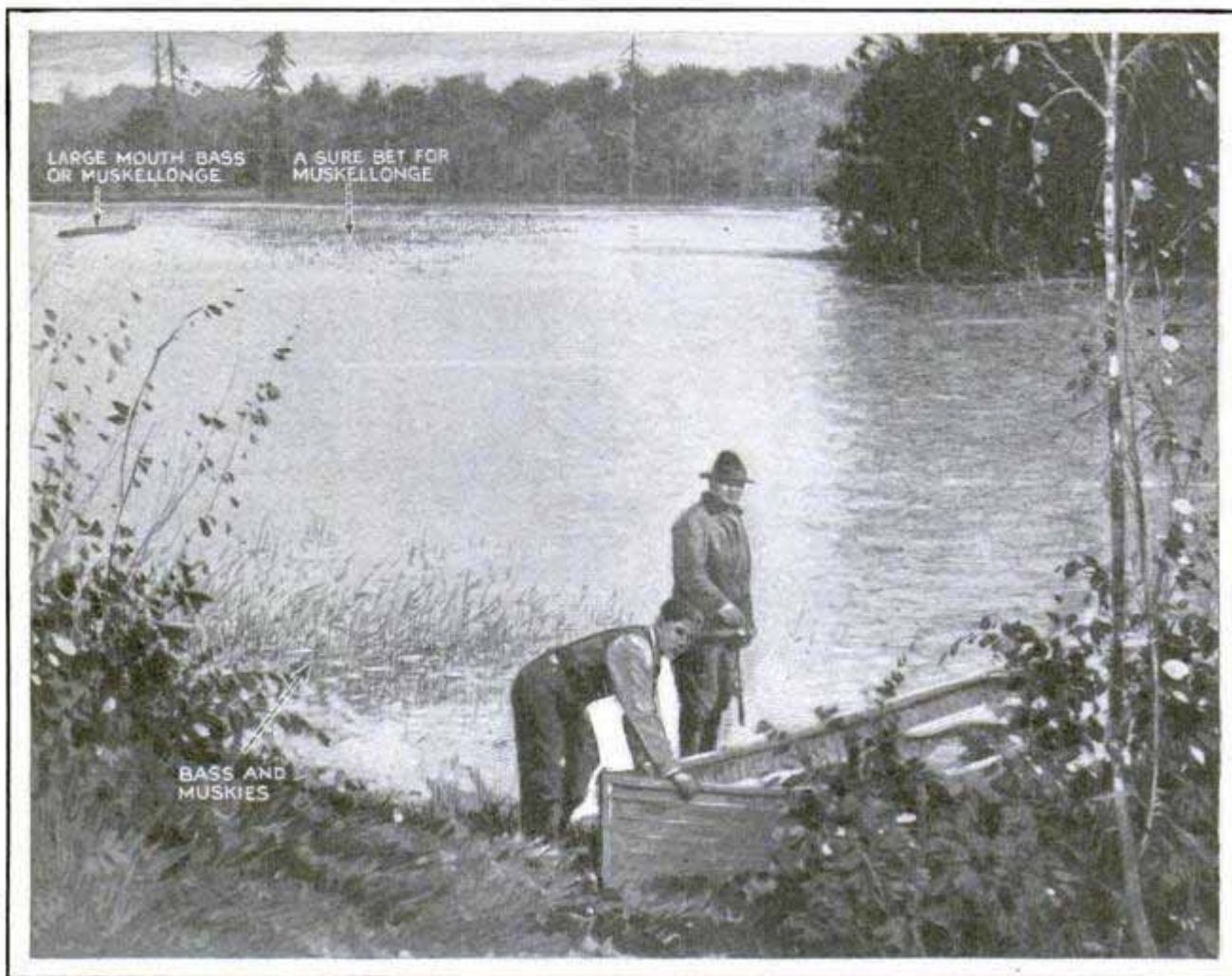


At Left Is a Wisconsin Muskellonge,
and, Below, Another, Just Taken from
a Weed Bed by Trolling with a Whirl-
ing Spoon Hook



String of Wall-Eyed Pike Taken on Live Minnows, the
Natural Food of This Species; the Successful Fisherman
Learns to Cater to Fish Tastes





A Fishing Diagram of Sugar Bush Lake, on a Wisconsin Indian Reservation, Showing Logs and Weed Beds and the Fish That May Be Found Lurking under the Shelter of Each

ranging feeding fish and you soon see why night angling should be, and often is, a successful and novel sport. Many birds and animals avail themselves of moonlight nights for feeding trips. For example, consider the wild duck. It will feed on moonlight nights and sleep or loaf during the day. Many species of fresh-water fishes apparently follow this idea. And they can spot their prey, too, as a bass, pike or a muskie cruising around in three, four or five feet of water gets a silhouette of moving objects above it if there is a moon in the sky.

In hot weather, moonlight fishing is especially productive, because of the illumination plus cool temperature. Cast a large floating artificial lure around the edges of shoreline weed beds and over sunken weed growths. Then manipulate this floating plug lure so that it twitches, jumps and darts around like a crippled minnow or mouse. The big bass catch sight of this black, struggling lifelike silhouette on the water. A surface lure

that kicks up a rumpus is a good one for moonlight use.

So it goes in fishing. It's a game in which one must use his eyes, study the habits of the species, apply a little "fish psychology" and then pray for luck.

CUSHION COVERS THAT OPEN UP PERMIT EASY CLEANING

Renovating and cleaning cushions is often a difficult task, but the work has been simplified by a recent improvement on the

cover. It is made somewhat like a pocketbook and is fastened with interlocking hook-less units, opened or closed simply by moving a little tab. The interior of the pillow may



be readily taken out for sunning, saving the cover from fading.

The Sanitique Corp.
411 Michigan Trust Bldg.
Grand Rapids

HOME OF ESKIMO ONCE IN ASIA NEW EVIDENCE SHOWS 1815

Further relics tending to support the theory that the original settlers of the new world, from the Eskimo to the Aztec tribes, had their first home in Asia, have been found by Dr. Ales Hrdlicka of the Smithsonian institution after a four months' expedition in northern Alaska. Buried pit villages and bits of fossilized, hand-carved ivory of fine workmanship were among the clues leading back some 15,000 or 20,000 years ago, Dr. Hrdlicka believes, when the pioneer Asiatics began their migration to the North American continent. It is possible that a land bridge may have connected the two worlds at that time or it was an easy matter to paddle across the straits. The physical resemblances between the American Indians and some Asiatic groups, and the fact that, in the middle of the last century, there is a recorded case of natives from Asia crossing in the far north and entering Alaska, tend to substantiate belief in the migration of the first Americans from Asia.

HOMEMADE WINDLASS SAVES CARRYING WATER UPHILL 1331

Supplying his hillside home with water from a spring in the hollow below, has been simplified by a Missouri man's ingenuity. He constructed a windlass, weighted it with stones and rigged the

Pulling a Bucket
of Water Up the
Slope; Spring Is
in Background



bucket to a wire in such a way that instead of walking up the hill with the water he can pull it up by turning the crank.



Besides Furnishing Abundant Heat, This Portable Electric Radiator Gives Forth a Cheering Glow

PORTABLE ELECTRIC RADIATOR THROWS HEAT TO FRONT

Economy and efficiency are claimed for a portable electric heater, designed like a radiator and operating on 220 or 110-volt currents. It is so constructed that heat is thrown to the front and the glow of the heating elements may be seen through perforations. It is finished in porcelain enamel on sheet steel and has a handy switch at the end.

LIQUID LENSES 1808

Glass shells filled with liquid have been devised by a French investigator as substitutes for ordinary lenses.

The invention is regarded as an important one, particularly in the field of astronomy. By the French process, a lens equivalent to one of the usual ground type, that would cost more than \$100,000 and take several years to complete, can be made in a few weeks and for less than \$1,000, it is reported. The fluid substance is inclosed between two hard-glass surfaces.

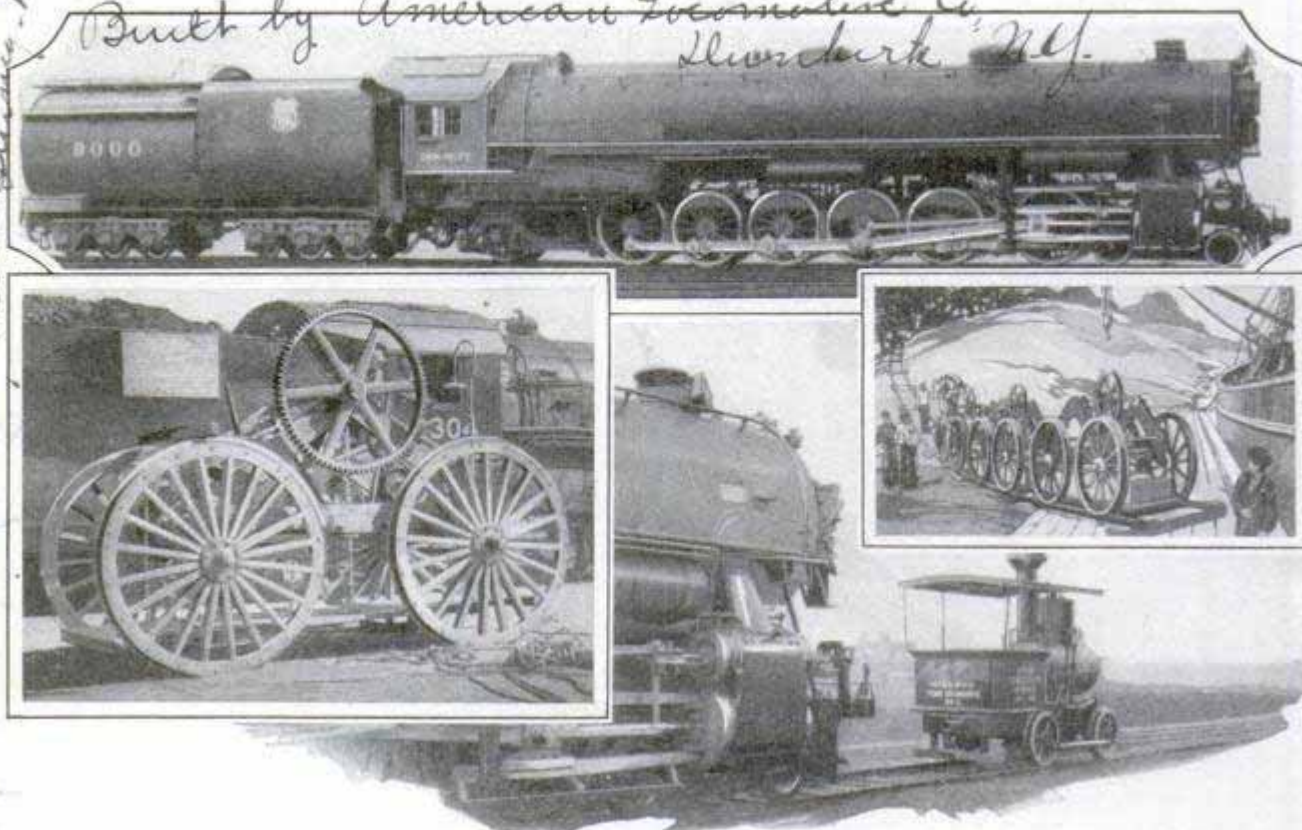
The new lenses can also be made for opera glasses, cameras, microscopes and like uses.

Cont. Edison Tarasse
90 The Farragut

Amco portable radiator wall
Mfr. Co., Lowell Sts.
Oakland, Calif.
Apex Landreagan

15 71
 778
 c/o Colburn Isear & Mfg Co
 98 Holmes St. Norfolk Islands, Mass
 first locomotive in U.S.
 Built by American Locomotive Co. Schenectady, N.Y.

GIANT ENGINE SHOWS GAIN IN SIZE AND POWER



Contrasts in Locomotives Show Railroad Development; at Top, New Union Pacific Engine Compared with "Oregon Pony" Below, and, in Center, Model of Vehicle and Sketch of First Railroad in America

The evolution of the locomotive engine was graphically illustrated in Portland, Oreg., recently with the arrival there of one of the Union Pacific railroad system's new 9000-type, said to be the largest and most powerful locomotive ever developed. For purposes of comparison, the 9000 was exhibited on the same track with the old "Oregon Pony," first locomotive engine in Oregon, which was put into service in 1862. The Pony has a driving-wheel base of seven feet. The 9000, with nine wheels has a driving base of thirty feet eight inches. It consumes between six and seven tons of fuel an hour. The coal is automatically stoked.

PAINT REMOVER MADE FROM OIL PREVIOUSLY WASTED

Instead of being wasted, as has been the practice, thousands of gallons of oil obtained as a by-product in the manufacture of paper pulp from wood, can now be used as the base for the preparation of an efficient paint and varnish remover. A method of mixing a substance from the oil with other materials has been patented

by government chemists and given to the public. The remover is said to soften the paint or varnish so that, within a few minutes after it has been applied, the old coating can be easily scraped away.

PASTE OF PHOTO CHEMICALS COMES IN TUBES

Photo-developing chemicals are now put up in paste form and used from tubes, to save the trouble of more bulky and less



easily carried materials. They are in concentrated form, are said to dissolve readily, keep indefinitely, and the correct quantities for different kinds of work can be measured out with little trouble. They are said to minimize the likelihood

of fogging and may be used with a red or deep-orange light.

Mr. Max Phillips
 and M. E. Boss.
 Dept. of Agriculture
 Washington, D.C.

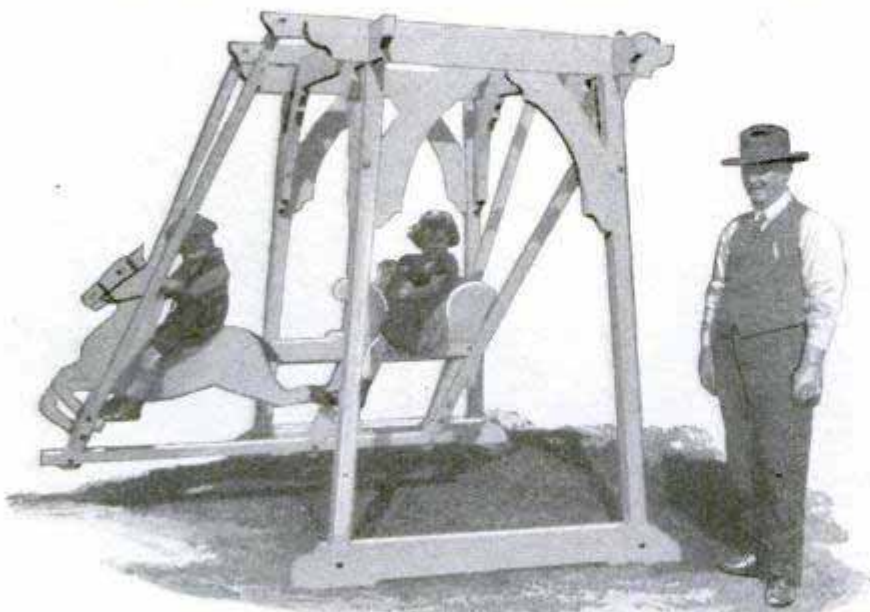
Preservant Co. of America
 423 W. 55th St. New York.

MYSTERY OF VANISHING RIVER TO BE SOLVED WITH DYE?

Geologists are faced with a problem in the river Manifold, a small stream in the Peak district of England, just over the Staffordshire border. It disappears, leaving a dry bed about five miles long. Farther on, a stream gushes out, but, so far, proof is lacking to show that it is the same river. Large quantities of green dye were dumped into the upper stream while watchers were stationed where the water welled up out of the ground. Not the faintest tinge of color could be detected. It was suggested that the dye was not strong enough to withstand the underground filtration, so another experiment with a different substance is to be performed. A somewhat similar test was made recently in digging the Moffat tunnel in Colorado to prove that water from a lake high above the bore was running into the passage. Chemicals were poured into the lake. Analysis of samples of water from the tunnel revealed the same chemicals.

HOBBYHORSE SWING DEVELOPS CHILDREN'S MUSCLES

Exercise without strain is the object of a children's lawn or porch swing with horse-shaped figures painted in bright colors. The riders pull a short bar with a rowing motion to produce the movement and thereby develop arms and legs.



More Fun and Helpful Exercise While Swinging; the Hobbyhorse Racers in Action; Supports Far Apart Prevent Accidents



Anchored Safe in Use; It Is Opened at the Bottom, the Slot at Top Being Too Small to Allow Theft

ANCHORED THEATER-OFFICE SAFE TO FOIL ROBBERS

To protect receipts in the cashier's office, a cylindrical safe is securely attached to a steel-and-concrete anchor, and money can be slipped into it without the attendant leaving the window. The door to the safe is so arranged that it will not stay in position unless locked, and the key may be kept by some person other than the cashier, the cylinder being stamped to show that the attendant cannot unlock the safe,

thus affording greater security in case of holdups. The fastenings to the anchor are concealed and the cylinder itself failed to break even when fifty-ton weights were dropped upon it. Owing to its compact form, the safe may be installed in space that cannot otherwise be utilized, such as an odd corner or wherever conditions permit the construction of a proper anchorage of concrete two or more feet deep to hold the steel tube to which the safe is attached, or the tube may be fastened to the floor joists.

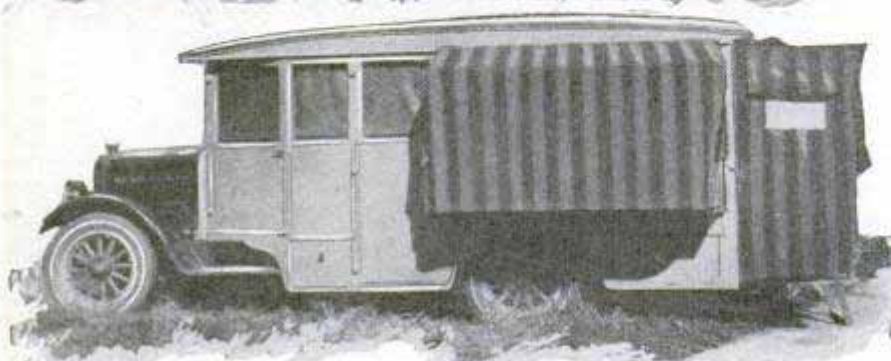
Reverence Safe Co. Keenawee

Inventor and mfr.

H. L. Neuchtel

*6916 - 72nd St. & 8
Portland, Ore.*

1201 Commerce Bldg.
POPULAR MECHANICS
Kansas City, Mo.



Car in Touring Form with Interior Exposed, to Show Rooms, and with Awnings Adjusted as for Making Camp

AUTO CONVERTED INTO HOME FOR TOURING

For lengthy auto trips, a metal body fits on almost any chassis in place of the regular equipment and provides several features not found in other camping outfits of this kind. Partitions are so arranged as to make three private bedrooms, each with electric light, current being supplied from a storage battery. The front seat can be made into a folding bed for two persons, and the rear is large enough for three adults. At the back is a small porch which may be let down and inclosed and has room for a folding cot. Bedding is stored under the seats when not in use, the windows are sliding and have roller curtains, seats and interior are trimmed with upholstering leather, and the woodwork is stained oak. In the rear are a toilet room, wardrobe closet and a shower spray is attached to the ceiling of the porch. A kitchenette is provided,

equipped with a two-burner gas stove and oven, water heater, pressure supply tank, socket for electric cooker, refrigerator, portable cook table and dining table that will seat four persons. When the car is closed, there are seats for ten, and all the equipment, including the spare tires, is kept inside. The outfit runs comfortably even at a speed of fifty miles.

FLOATING DAM TO PREVENT FLOODS IS REMOVABLE

139 Because of the recurring danger of floods, the use of permanent dams for irrigating the Imperial valley in California is not allowed across the Colorado river above and near Yuma, Ariz. A substitute has been found in ~~barriers~~ fashioned of brush bundles which can be dynamited and floated away when high waters approach. They are replaced after the flood season. Each unit is about twelve feet wide and fifteen feet high, and is fastened with cables to piling driven deeply into the silt of the river bed to hold it securely during normal conditions of the stream.



Views of the Brush Sections from the "Seasonable" Dam across Colorado River, Showing How It Is Lashed Together

Cont. Charles J. Esrimes
1037 Third Ave.
St. Paul, Minn.

1475 Carr. & Munn M. Carr. Jr.
The Michigan Daily, Press Bldg
Ann Arbor, Mich



Shrouded in Netting for Protection against Vicious Flies and Mosquitoes, the Explorers Inflate a Pilot Balloon to Explore the Upper Air above Greenland's Ice Cap

Exploring the Home of the North Wind

Secrets of Greenland's Ice Cap, Where the Cold North Winds Are Born, Are Sought to Help Predict Weather

HUNTING for the secrets of the north wind whose frigid vapors are born on the vast ice cap of Greenland, the world's last unknown continent, a party of American explorers will sail the latter part of May to recover self-recording instruments they left in the far north last summer, and to push on into the unknown land of glaciers.

Greenland's winds, chilled by sweeping over the huge refrigeratorlike ice continent, play an important part in determining what the weather of the Atlantic ocean, North America and Europe will be. In themselves they are not dangerous, but the influence they have on the warm tropical winds from the south cause storms and fogs. The disastrous tropical cyclones which swept the southeastern states last year were forced out of their normal path and turned inland by the wall of cold air sent southward in a Greenland anticyclone. When the two walls meet, they produce the fogs that hang much of the summer over the North Atlantic steamship lanes, and Greenland, too, produces the icebergs that menace navigation at that season.

Prof. William Herbert Hobbs, and a party of scientists representing the University of Michigan, laid the ground last summer to solve the weather secrets of the far north when they pushed their way up onto the glacial ice cap and took the first weather observations there.

Greenland's icy mountains, made famous in song, do not exist. Instead the continent rises in a vast dome of ice, the interior a frigid plateau high above sea level, while the ice, pushing outward and downward, slides ceaselessly into the sea, to break off in chunks and go drifting southward as icebergs.

On top of the dome, where summer temperatures average around thirty degrees below zero, the air settles and contracts from the intense cold, and then slides down the ice slopes to the sea, while its place is taken by warmer air rushing in from above, to be in turn chilled and displaced again. That steady movement initiates the Greenland anticyclone.

The Hobbs expedition last summer founded a permanent base camp, named for President Little, of Michigan university, just north of the arctic circle,

fifty miles east of Holstensborg. From there, with the aid of Eskimos, supplies were packed inland to the edge of the Otto Nordenskjold glacier, where the ice cap begins. Four of the explorers, with four natives, climbed the glacier itself, after hunting for three days for a passage, and spent several days there, until they were driven back by lack of food.

A sounding-balloon expert from the United States weather bureau, who accompanied them, sent up the first upper-air balloons ever launched from the frozen continent, and traced their course to a height of 45,000 feet, getting valuable data on the movement of the upper air. One balloon, sent up with a cargo of recording instruments to take the temperature and air pressure in the upper atmosphere, did not come down when the automatic deflator failed to work, and for a time was believed lost with its valuable freight. Several days later, and six miles away, the balloon was picked up in an ice crevasse, and the instruments, with their records, were found intact.

This year's expedition will leave two men with wireless equipment to make a daily study of weather conditions for fifteen months, picking them up again in the summer of 1928. The two will establish their station 1,500 feet above sea level and report weather and wind conditions daily by wireless to the weather bureau at Washington.

The expedition will go north on the "Morrissey," a little eighty-three ton schooner used last year. On the return

trip that year, the "Morrissey," carrying twenty-six as crew and passengers, besides two polar-bear cubs being brought back as live trophies, was nearly lost. The ship struck an uncharted reef soon after leaving Greenland and had its entire keel scraped away. Next, the propeller of its little auxiliary engine dropped off into the water several thousand feet deep, and from then on the keelless ship had to rely on sails, a difficult feat without the balancing weight of the keel. Head gales soon arose, and after three days of slow progress, during which the ship was swept again and again by icy seas, the crew sought shelter in the straits of Belle Isle. Taking advantage of a fair spell later, they set sail again, and cleared Belle Isle only a few hours before a fresh gale wrecked villages on the land and swept their former anchorage. Running before the wind, in imminent danger of being overtaken by following seas, the little craft eventually reached Sydney, N. S., after a sixteen-day trip.

DOCTORING ANIMALS AT ZOO KEEPS KEEPERS BUSY

1529 Doctoring sick elephants, giving the rhinoceros pills, and tying bandages on snakes in such a manner that they will remain in place, are episodes of the day's work for zoo veterinarians. If necessary, the subject can be chloroformed. Three different sizes of air-tight boxes are used, and while an operator pumps chloroform vapor into the chamber, he can watch



Veiled and Hooded, and Carrying All Their Supplies and Instruments on Their Backs, the Ice-Cap Party Sets Off from a Grassy Meadow Bound for the Regions of Eternal Ice

the imprisoned animal through a window. The dental department is equipped with a wedge-shaped barred box into which a wild boar, for instance, can be tightly jammed so that the dentist can clip his tusks with comparative ease. The doctors usually mix the animals' medicine with the food whenever possible. Hence, when the rhinoceros is a little run down and needs a tonic, eight grains of strychnine, about 120 times the maximum dose for a person, are squirted into the center of an orange, a favorite food. Since the rhino weighs two tons or so, the huge dose is not fatal. Zoo experts say that the dangerous animals are usually peaceable among themselves in confinement, most of the quarreling being confined to the monkeys.

ENGINE MADE IN BOTTLE RUNS BY COMPRESSED AIR 1324

Model ships and other objects made inside of glass bottles are not uncommon, but few such pieces have been assembled accurately enough to permit them to run, even if they were constructed for that purpose. The engine shown here, however, works smoothly under compressed air, introduced through the pipe in the cork. It is put together with the aid of delicate tools and magnets, and represents the work of a southern craftsman in the employ of a large railroad. He turned out the parts, with the exception of the aluminum base, on his own lathe.



COR Marlette
Burlington, N.C.

Relics of Ancient Worship; Ceremonial Masks from the Regions of the Upper Amazon River



MYSTIC RITES OF ANCIENT TRIBE REVEALED BY MASKS

What is believed to be the first collection of ceremonial masks ever gathered from the regions of the upper Amazon has been brought to America by Arthur H. Fisher, a Philadelphia naturalist, who made an expedition into South America in the interests of the Museum of the American Indian, Heye foundation. The pieces represent beasts and birds as well as human subjects, and are curiously fashioned and painted. They were obtained from a tribe in Peru. Pieces of pottery were also collected. To the uninitiated, the masks bear a strange resemblance to the figures appearing on totem poles, or to the crude designs made by children.

New York

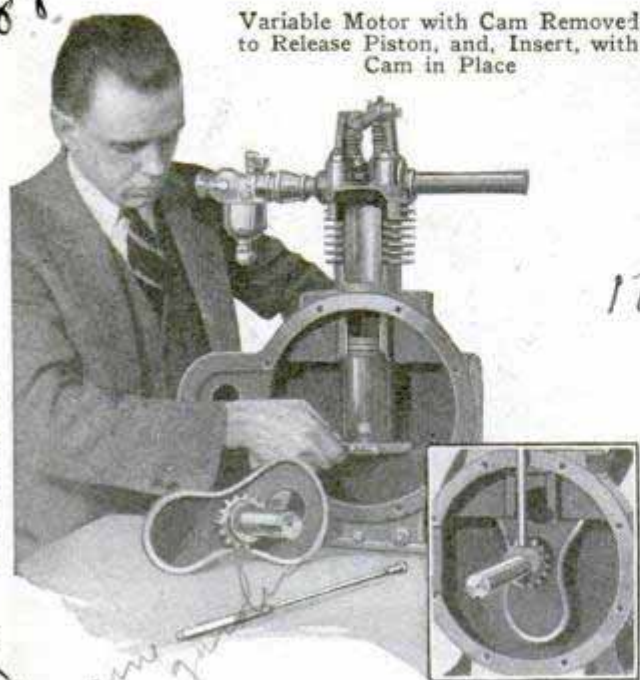
PLANE CONQUERS SNOW 1587

After a futile attempt which lasted for twenty-six hours, to reach a break in a power line through heavy snows, repair men abandoned their horses and automobiles and took to an airplane. In less than three hours, the damage had been mended and the workers were back at their starting point. They reported that the airplane, flying at low altitude, enabled them to scan several miles of line at once, revealing places where the cables sagged dangerously as well as the actual break.

near Ford, Kans.

Electric Service Co.,
Lodge City, Kans.

Variable Motor with Cam Removed
to Release Piston, and, Insert, with
Cam in Place



type complete, except for the eighty-pound flywheel, weighs fifty-six pounds, whereas the five-cylinder automobile engine will weigh about 120 pounds. The entire one-cylinder engine, the inventor claims, can be torn down from running position and reassembled in the exceedingly short time of a little more than seven minutes.

1782 VEGETABLE SOLD BY YARD
 A measure of vegetable marrow, gal.

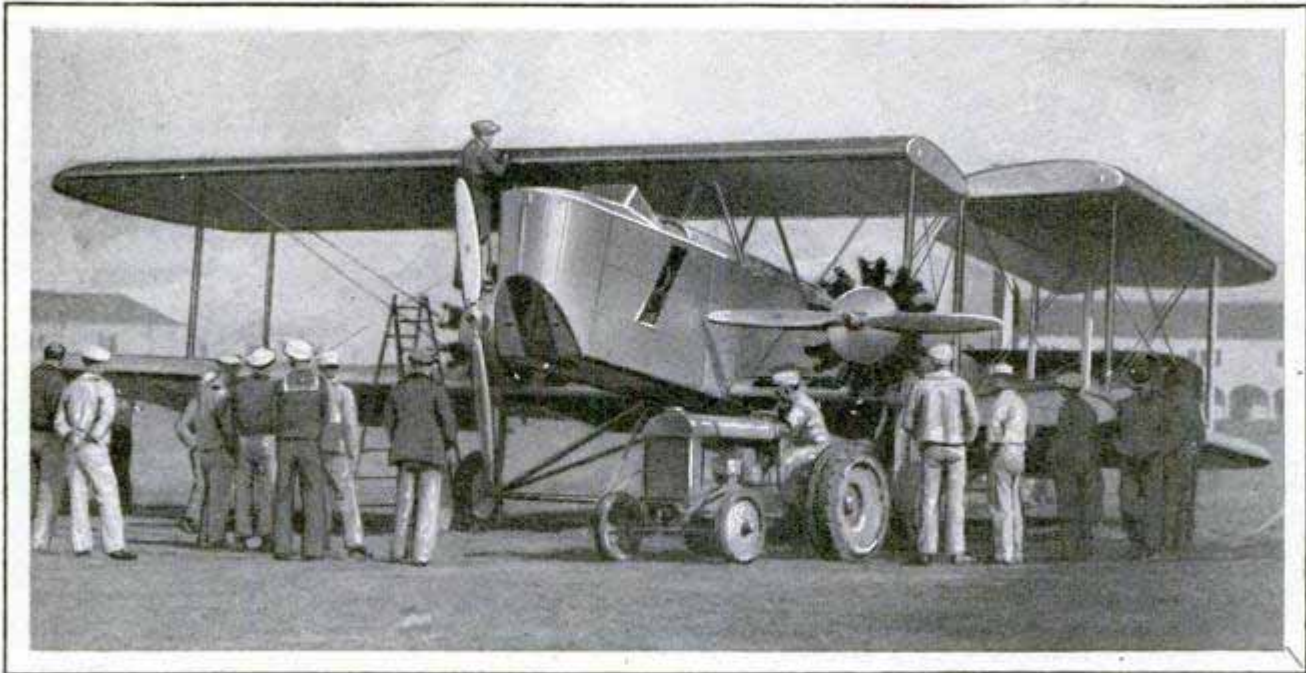
A species of vegetable marrow, raised on the island of Malta, grows so rapidly that a person can almost see it move in little jerks, and attains such length that it is sold by the yard in native markets. It is split up into small pieces, boiled and served in much the same way as summer squash is prepared in this country.

Young Holke
PAPER ANIMALS WIN FAME
FOR CRIPPLED BOY 16

Although he is shut off from animals and the outdoors by an illness that has confined him to his bed since childhood Joe Cranston Jones, a seventeen-year-old Augusta, Ga. boy, is able to picture jungle beasts and other creatures through silhouettes that he clips from paper. He does not trace the designs first, and the accuracy of the work has amazed noted artists. From the sale of his silhouettes he has purchased a small automobile which has been fitted with a special brace so that, on fair days, he and his mother can drive out to study the wild life of the woods for new subjects.



Cut without First Tracing the Designs, Paper Silhouettes by Seventeen-Year-Old Boy Confined to His Bed



Big Bombing Plane with One of the Hinged Wings Folded Back to Show How the Ship Could Be Stored in a Relatively Small Hangar

FOLDING-WING BOMBING PLANE TO SAVE HANGAR SPACE

Douglas
Collapsible wings, which can be folded back to save hangar space are a feature of a late type of bombing airplane. The big craft, which has two 450-horsepower motors, normally develops a cruising speed of 112 miles an hour.

BARKLESS DOG PRODUCED BY ANIMAL RAISER

Packard
A new type of dog that won't annoy the neighbors, because it is barkless, has been developed by an animal breeder at Olympia, Wash., as a result of experiments through interbreeding with Siberian sledge dogs. The idea of a dog without a bark is not new, as the Alaskan huskies have always been in that class, owing to their wolf blood, but crossing the wolf strain with gentler house pets is unusual. Like the wolves and the northern huskies,

the new dog will, when hungry, howl, somewhat after the manner of a wolf, but when well fed it is as quiet as the giraffe, which has no vocal cords at all.

AUTO BRAKE-TESTING CLUTCH HELPS PREVENT ACCIDENTS

Automobile brakes are quickly and accurately tested under full-load conditions with a simple apparatus which is adapted to two or four-wheel installations, hydraulic or mechanical. It consists of an adjustable clutch which fits over the tire and a jack to hold the brake pedal in load position. To test the brakes, the car is raised, the clutch is placed around the tire and the pedal held down with the special jack. By pressing on the beam handle of the tester, a scale indicates the number of pounds required to turn the wheel while the brake is set in load position. With this outfit, it is easy to equalize all of the brakes, eliminating various troubles.



Brake Tester in Operation; Indicator on Handles Tells Number of Pounds Required to Turn the Wheel

N.Y. Herald 2/20/27

*1961
Simplicity Mfg Co,
Cath Washington, Wis.*



Simplex Jack
Braces Installed to Prevent Cave-In; They Are Easily Set at Angles if Necessary

BALL-AND-SOCKET TRENCH BRACE GRIPS AT ANGLES

Quick adjustment and tight gripping at all angles are afforded with trench braces that have a ball-and-socket base and a screw handle for tightening. This latter feature is especially useful in moist soils, where the sheeting may become loose and the risk of cave-ins increased.

OCEAN FLOOR YIELDS FORTUNES TO SHRIMP FISHERS

182 Millions are taken from the ocean beaches off the Mississippi coast in supplying the nation with shrimps. While the work of the fishermen may not be as romantic as that of the hunter after buried pirate treasure, their reward is more certain and no maps or detectors are needed

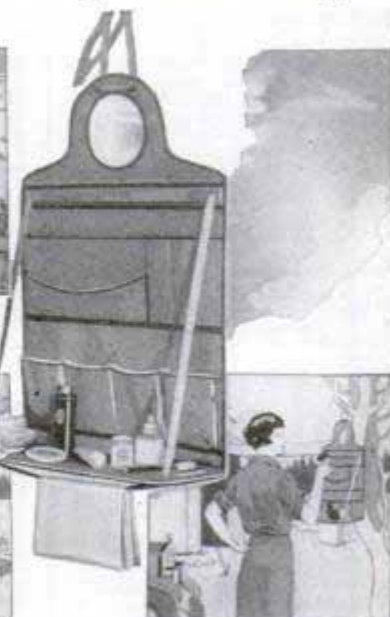
to locate the wealth. Long brown lanes in the water, formed of mud and debris kicked up by the shrimp feeding on the bottoms, reveal where the catch may be found. The boats used are from thirty to fifty feet in length and are thoroughly seaworthy for weathering severe storms. Some of the older craft are giving way to the power "trawlboat," but many men refuse to employ the new-fangled skiffs. Nets are from fifteen to twenty feet in depth and seventy-five to 100 feet long. One of the hazards of the fishing is the shark, not because of the physical danger to the men, but because it destroys the nets, causing delays and losses. More than twenty packing and canning factories have been built near the shrimp-fishing grounds. Once a year, the workers forget their toil and prepare the boats for the schooner race for the championship of the gulf of Mexico, a feature of the annual regatta of the Biloxi yacht club.

CAMPERS' FOLDING TOILET KIT HAS SHELF AND TOWEL RACK

1708 Rolled up like a bill fold when not in use and occupying but little space, a dressing kit for campers provides a shelf, towel holder, mirror and many other conveniences when extended. There is ample pocket space to hold various articles, and the shelf drops down automatically when the kit is suspended. The holder is quickly fastened by cord in a loop at



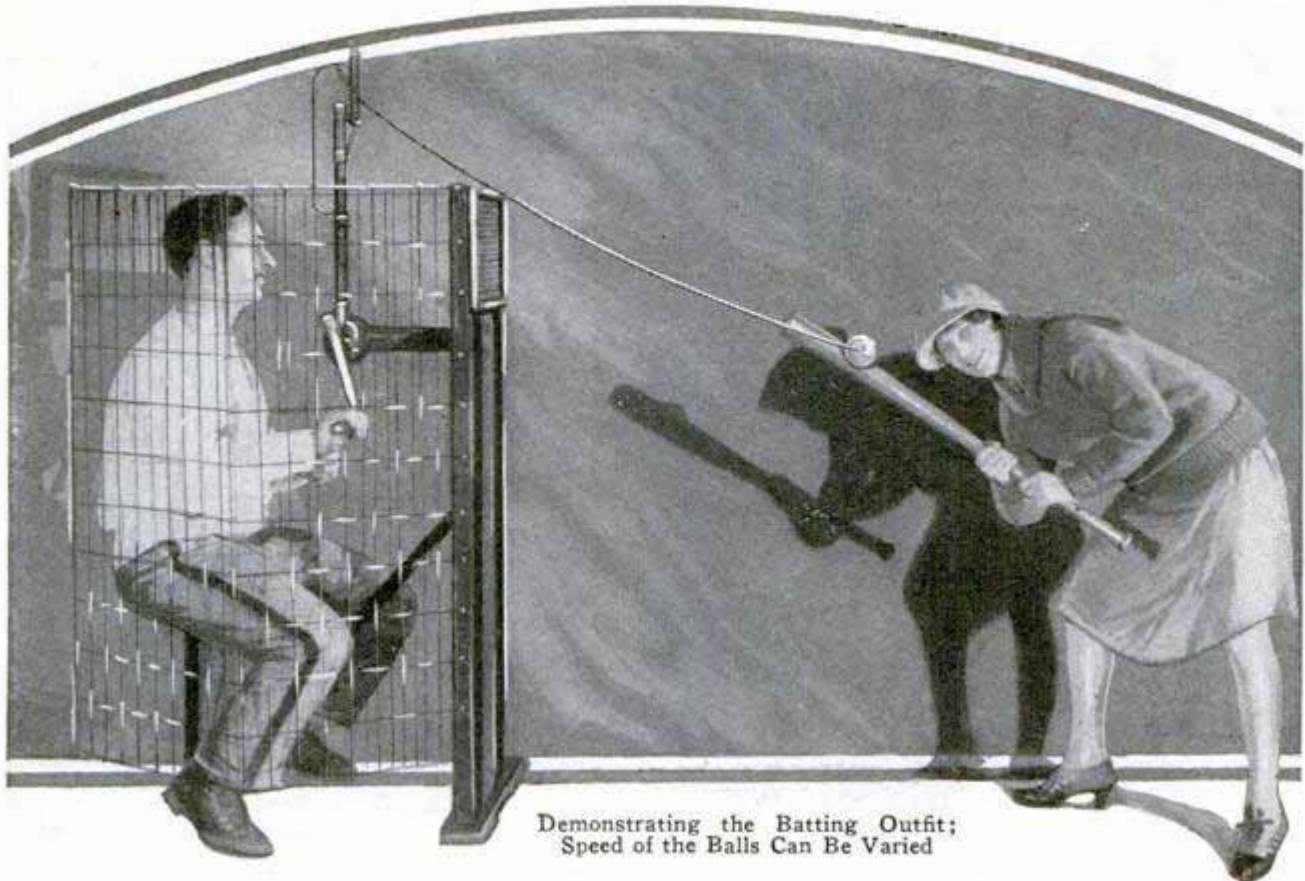
Kit and Various Ways of Using It



the top and is made of materials designed to resist the wear and tear of camp life.

Chicago Daily News
2/21/29

J.A. Smith & Co
185 N. Wabash



Demonstrating the Batting Outfit;
Speed of the Balls Can Be Varied

BASEBALL-PITCHING WHIP GIVES EARLY INDOOR PRACTICE

For indoor baseball-batting practice, a mechanical pitching machine projects a captive ball at varying speeds from a sling apparatus. The operator is protected by a wire cage.

NEW SPEECH CODE IN NUMBERS FOR UNIVERSAL LANGUAGE

International communication "by the numbers" is afforded in a code of speech devised by Capt. Manly B. Gibson, of the United States coast artillery. It is based on the common numerals from 0 to 9, which are familiar to people in most civilized parts of the world, and is said to have been easily deciphered in a number of tests, using subjects who had received only a hasty explanation of it before the demonstration. Each of 10,000 words in the English language is represented by a number and this number also represents the corresponding word or idea in twenty other important languages. Nouns begin with 1, 2 or 3; verbs with 4, adjectives with 5, adverbs with 6, pronouns with 7, conjunctions with 8 and prepositions with 9. The sentence "The boy eats the red apple,"

would be written by the code thus: "5 111 409-10 5 516 2013." The hyphenated figure signifies the tense. Verbs followed by 10 are in present tense, those followed by 30, in future tense. Singular and plural nouns are denoted by odd and even numbers respectively. For instance "111" stands for boy in any language while "112" indicates boys. In sentences, the predicate is underscored by one line and the subject by dashes. It is said that the code is suited to communication by wire.

SINGLE-HANDED CASE FOR CARD SUBSTITUTE FOR BOOK



Fitting flat in the pocket and occupying but little space, a card case is so arranged that a push of the finger exposes a card, simplifying its removal and saving the trouble of opening a closed container or tearing

ing out of a book. It can be operated by one hand, saves time and confusion and holds a generous supply.

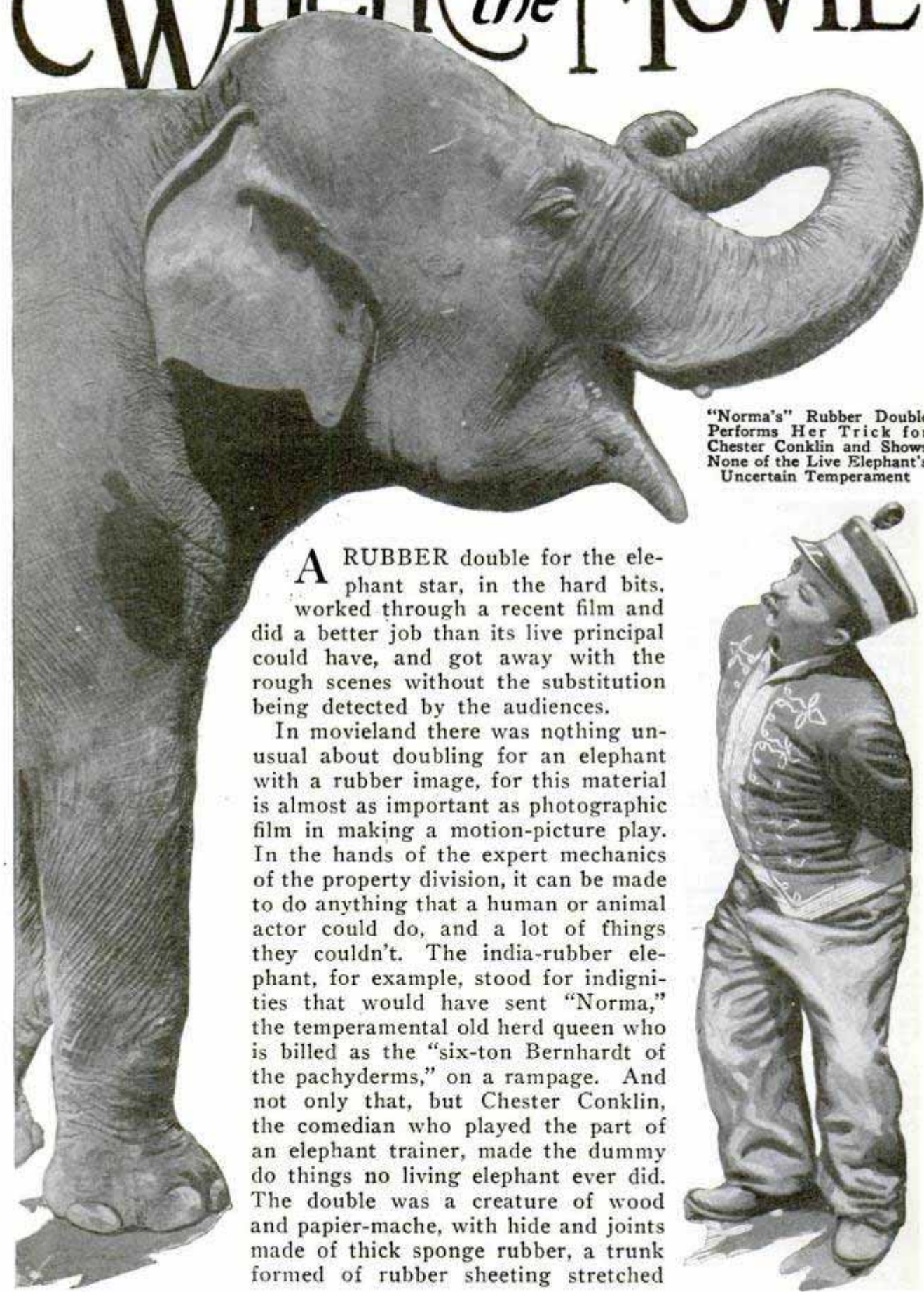
W. O. Black & Co
432 S. Dearborn

W. O. Baker
San Francisco

1487

1/1/27

When *the* MOVIE



"Norma's" Rubber Double Performs Her Trick for Chester Conklin and Shows None of the Live Elephant's Uncertain Temperament

A RUBBER double for the elephant star, in the hard bits, worked through a recent film and did a better job than its live principal could have, and got away with the rough scenes without the substitution being detected by the audiences.

In movieland there was nothing unusual about doubling for an elephant with a rubber image, for this material is almost as important as photographic film in making a motion-picture play. In the hands of the expert mechanics of the property division, it can be made to do anything that a human or animal actor could do, and a lot of things they couldn't. The india-rubber elephant, for example, stood for indignities that would have sent "Norma," the temperamental old herd queen who is billed as the "six-ton Bernhardt of the pachyderms," on a rampage. And not only that, but Chester Conklin, the comedian who played the part of an elephant trainer, made the dummy do things no living elephant ever did. The double was a creature of wood and papier-mache, with hide and joints made of thick sponge rubber, a trunk formed of rubber sheeting stretched

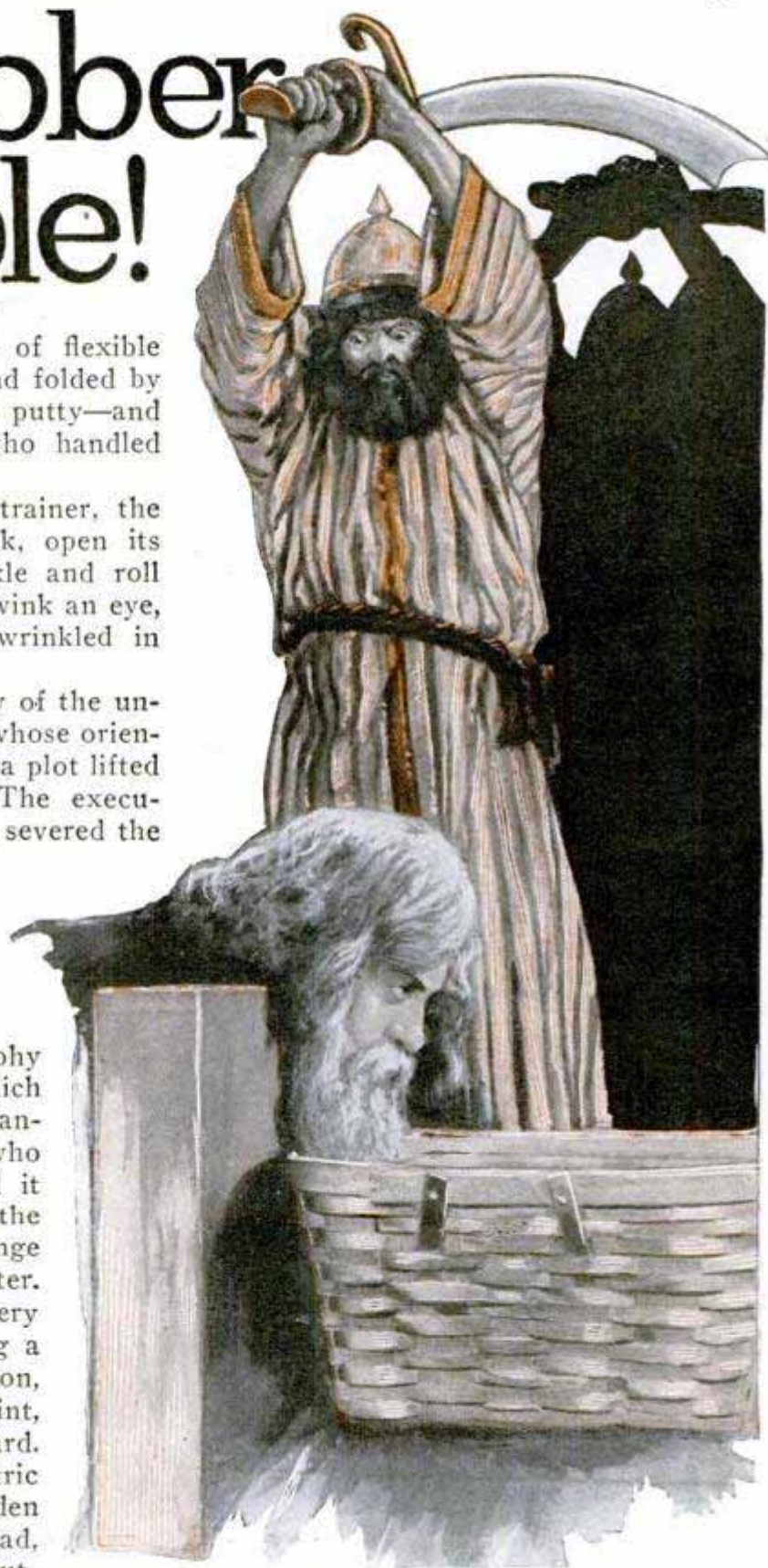


ELEPHANT *has* a Rubber Double!

spirally around a long coil of flexible spring wire, a skin creased and folded by ridges and lumps of rubber putty—and inside it was an operator who handled the control levers.

At a command from the trainer, the dummy could wave its trunk, open its mouth, sway its head, chuckle and roll with laughter, flap an ear or wink an eye, while the skin moved and wrinkled in lifelike fashion.

Rubber made possible many of the unusual scenes in another play, whose oriental motif smacked strongly of a plot lifted straight out of the Bible. The executioner, with one mighty blow, severed the head of one of the actors, without damage to his neck, the explanation being a rubber scimitar and trick photography. After the harmless blow of the rubber sword fell, a bit of trick photography substituted a rubber head, which tumbled into the basket. In another scene, when the dancer who had demanded the head had it served up on a silver salver, the head began to glow with a strange light, steadily growing brighter. The head was formed of very transparent rubber by dipping a face mask in a rubber solution, outlining the features with paint, and gluing on hair and a beard. To make it glow, an electric light, connected to a hidden cable, was inserted in the head, and gradually turned on by cutting out resistance placed in the electric line.



Courtesy India Rubber World

Trick Photography and a Lifelike Rubber Head Make This Oriental Execution Scene Possible

A Realistic Iguana That Wiggles and Snaps Passes Muster on the Screen, Though It Is Only a Rubber Copy of the Animal



A recent film pictured a snake charmer offering a wriggling iguana, a large and repulsive sort of lizard, to a Salvation army lassie who stepped back in horror. The frightful-looking reptile was a perfect specimen, for the original beast not only sat for the reproduction, but actually furnished the mold. The studio technical staff simply froze the lizard and then cast it in plaster, removed the two-part mold and filled it with a soft rubber compound, which was then vulcanized to provide the skin. Bead eyes were inserted, a serrated crest, formed of a notched strip of rubber, was cemented in place, a throat sack of netting attached, and the lizard was painted green and yellow. The snake charmer, by deftly working the mouth with one hand and wriggling the tail with the other put life into the beast. In another scene, where it leaped on an unsuspecting actor, a property man, hidden behind a papier-mache boulder, simply threw it into the arena.

In another movie, a six-foot chuck-walla lizard pursued players and lashed them with its sawlike tail without damage, because it, too, was only rubber. This one, though, was hollow, and contained clockwork which moved its feet and tail, while a fine and, to the spectators, invisible piano wire, operated from off-stage, pulled it around.

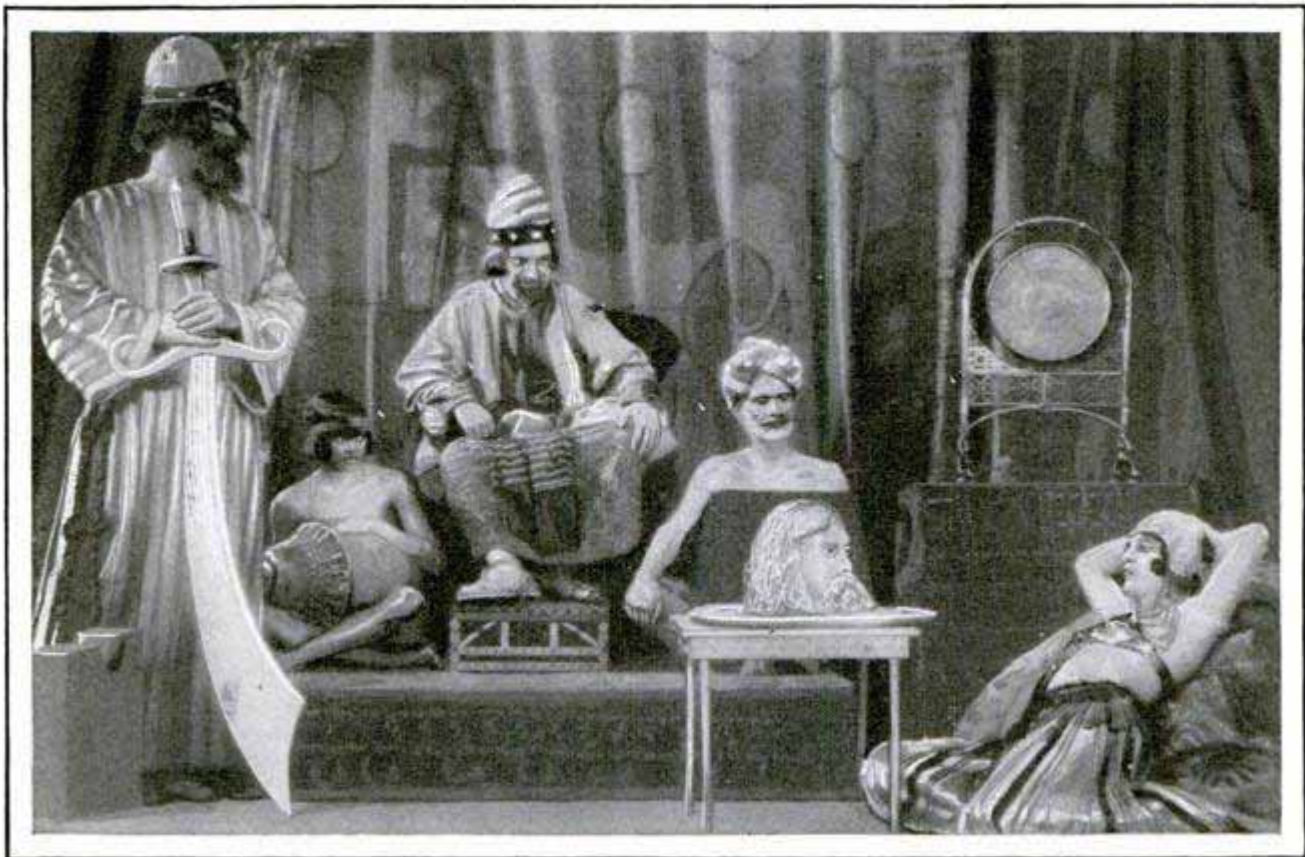
The comedy films use more rubber aids than any other branch of the movies. If you have ever seen a comedian seemingly

suffering from heat, strain or fright, suddenly begin perspiring in floods, you probably didn't realize that rubber made it possible. A hollow skullcap-shaped water bottle is fitted over the head and attached by rubber tubing to a large bulb of water in the pocket. To perspire, the comedian simply presses the bulb and water flows from a row of small openings across the forehead. A comedian in one film, playing the part of a bootlegger, cheated his patrons by making the

liquor vanish from the glass after they had paid their money. The liquid was poured from a flask held in one hand to a glass held in the other, but instead of actually coming from the flask it was ejected from a bulb under the arm, operated by pressure of the elbow. A tube from the bulb ran down inside the coat sleeve and through the bottom of the flask up to the neck. As the flask was tilted, the liquid was forced out by pressing the bulb, and to empty the glass, the player had only to release the bulb pressure while keeping the neck of the flask in the glass, whereupon the liquor was promptly drawn back up the tube.

One famous comedian, in a circus scene, kept interfering with the stake-driving crew, until finally he stuck his head underneath the pile driver, when the weight was released and dropped on him, but instead of flattening him to the ground, the weight bounced back, to the apparent amazement of the circus gang. The weight was only sponge rubber, inclosed in a thin metal tube.

Dummies dropped from heights are usually made of rubber so that they will bound and bend in lifelike attitudes instead of collapsing limply on the ground, as the old-time straw dummies did. When the comedian is knocked into a cactus plant, as so often happens in a film with a desert setting, the spines do no damage, for the movie cactus is only a collection of ordinary hot-water bottles, with rub-



Another Scene, in Which the Severed Head Begins to Glow as the Current Is Turned On in an Electric Light, Hidden beneath Its Thin Rubber Composition, Producing an Unusual Effect

ber spines cemented on, the whole being mounted on lengths of rubber garden hose. Similarly, scraps of sponge rubber are often used to imitate leaves and foliage on trees and shrubs.

Filmland fairies, who float, soar and dip with ease through the air in sylvan settings are often real live girls, suspended by elastic cords, formed of a number of pure-rubber threads, placed side by side, then bound with braid, which is painted to match the background, so it will not photograph.

A hideous gorilla in one movie was only a man incased in rubber. The head was produced from a two-piece plaster mold of a real ape head, somewhat larger than that of a man, with openings for the player's eyes and ventilation through the ape's nose. The costume was completed with a rubber suit covered with rough hair. Rubber suits are used extensively in water scenes. They are made skin-tight and have but five openings, neck, ankles and wrists, and are donned by stretching the neck so the player can crawl into them. Rubber face masks also are extensively used in scenes where ordinary make-up could not produce the type desired. As they can be padded to any

shape, they produce unusual effects, and likewise remove the chance of the actor not reproducing the make-up he used in previous scenes.

The record for the biggest rubber dummy ever made is still held by the German film company who produced an enormous dragon a few years ago, which contained a whole battery of electric motors, pumps and lighting effects, as well as a crew of several men. In the final scene the hero slew the dragon with a sword thrust, which punctured rubber bags containing a red fluid that flowed out in streams as the dragon expired.

1702

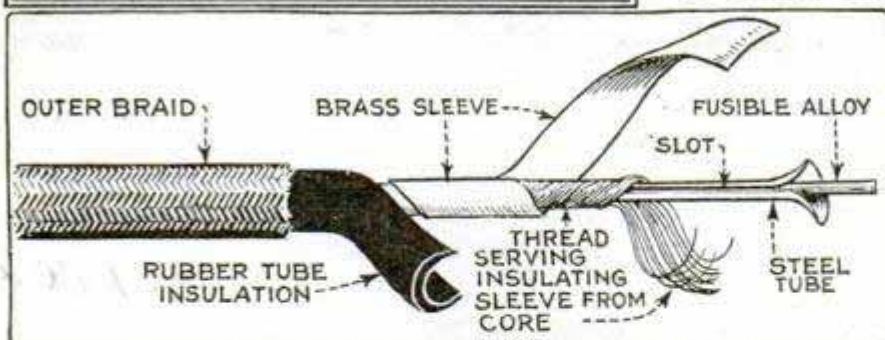
CONCRETE MAP OF THE WORLD COVERS SEVERAL ACRES

American boys attending a school near Paris are laying out one of the most ambitious maps ever attempted, a huge plat in concrete, with real water for rivers, smoking volcanoes and other features. The seas are deep enough for the pupils to ride by boat from one port to another, tiny railroad trains are drawn by steam engines and the continents are accurately represented in cement, with mountain ranges and other points indicated.

W. J. James 2/2/27

FIRE-DETECTING WIRE PROTECTS LIFE AND PROPERTY

Alarm is given at the very start of a fire by an easily installed detecting sys-



Part of Apparatus Installed in Home, and Diagram of the Wire, Showing How Alarms Are Sounded

tem that has as its chief functioning unit a special kind of wire, readily concealed and acting as a short-circuiting means to ring a gong. The wire has a core of fusible alloy. At a certain temperature, this expands, spurts through and comes in contact with an outer brass sleeve, causing the "short." The wire is only three-sixteenths of an inch in diameter and may be tinted or painted to blend with walls

or moldings. It is thoroughly insulated against moisture and otherwise protected, so that false alarms are said to be next to impossible. Storage batteries supplying electric current for the system are charged automatically, keeping the apparatus always in condition. The protection is suitable for installation in homes, offices, industrial plants, ship interiors and many other locations.

COPPER-PLATED SHOTGUN SHOT 1838 REDUCE SCATTERING

The chief reason why the shotgun scatters its charge is that the shot do not emerge in their original round form. This is due to the battering and scraping the soft lead pellets get during the passage through the barrel. A 12-gauge shotgun seldom has a killing range of more than seventy yards and few guns will put more than three-fourths of their shot inside a thirty-inch circle at forty yards. To increase the effectiveness of the shells, by reducing this tendency to scatter, copper-plated shot have been introduced. They are said to be about thirty per cent harder than the hardest of the older type of chilled shot containing antimony, and tests have shown that they add much to the effectiveness of the gun. They also reduce "stringing," the tendency of the charge to stretch out in traveling through the air

where the battered shot cannot keep up with the round ones. The copper pellets go in a shorter, denser cloud. The plating process has also been applied to .22-caliber long and short rifle bullets. They require no grease or wax and can be carried without collecting dirt or getting the pockets greasy. These bullets should not be confused with the copper-jacketed type, which are made by forcing the bullet inside its copper coat, the latter being made separately. The new copper-plated bullets have been tested at 200-yard range and proved to be much more accurate than the old type, because they come out of the cartridge with perfect bases and give perfect delivery at the muzzle.

Western Cartridge Co.

1720 N. Michigan Ave. New York 7/19

MOVIES OF GERMS
TO AID WAR ON
DISEASES 1836

Motion pictures, revealing the habits of disease germs, were exhibited at a meeting of the American college of physicians. The films suggested an improved way for recording cases and teaching medical methods. Microscopic photography and a cold-light process were utilized in taking the pictures. This light was obtained by interposing a cell of flowing ice water between the lamp and the slide on which the germ culture was placed. With this arrangement, motion pictures of living animal tissue, showing how the cells of the body grow and divide have been taken.



Clark Making a Stump Carving While His Puppy Patiently Poses; the Indian's Work Has Been Widely Exhibited

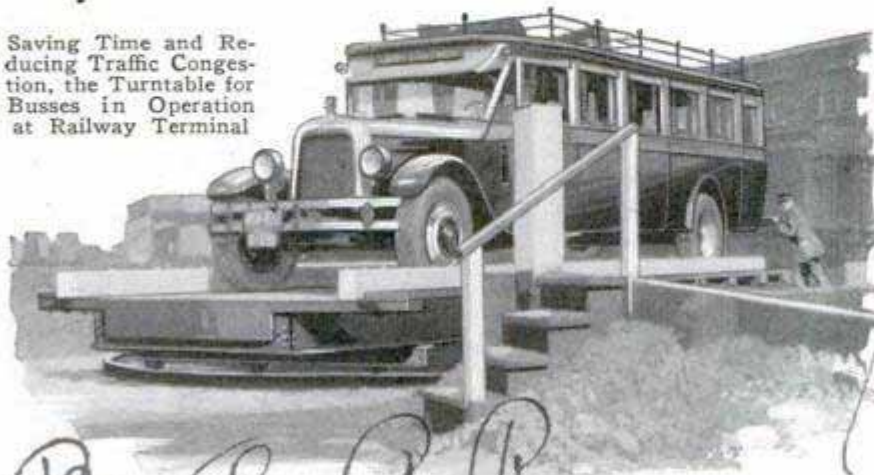
CARVING FROM STUMPS WINS
FAME FOR INDIAN

With chisels, mallet and a few others as his only tools, John Clark, an Indian in the Glacier National park preserve, has won wide recognition for his realistic carvings of animals and other subjects. As shown in the accompanying photograph, he does his work from live models, the dog here being one of his favorite puppies. Samples of his skill are on exhibition in various art museums.

TURNTABLE FOR MOTOR BUSESSES
SPEEDS CITY TRAFFIC 1609

Motor coaches are used at a railroad terminal in Jersey City, with less congestion and greater speed in transferring passengers directly from the cars to different points, with the aid of a turntable which eliminates the difficulty of backing up and reversing direction in crowded quarters. The unit is much like those employed at railway shops, is easily turned by hand and permits running the busses close to the train platform so that passengers can enter the vehicles without walking.

Saving Time and Reducing Traffic Congestion, the Turntable for Busses in Operation at Railway Terminal



PERFUME AS ANTISEPTIC HELPS
PREVENT INFLUENZA 1818

That inhaling perfume from certain kinds of flowers is a protection against colds and influenza, is the conclusion of an official of a large perfume factory. Bottling and packing employes almost entirely escaped an epidemic, while many persons in other divisions were ill. The explanation suggested is that some of the flower perfumes contain highly antiseptic substances. Among these are the carnations, roses and lily of the valley.

W. Charles
Loughborough

Leicester-shire, Eng.

1589

Box 492, Seattle Wash. *ship navigator*

Echo Sailing in Dangerous Waters



Steamers Emerge from a Winter's Run through the Inside Passage from Alaska Coated with Ice, That Weights Down All the Forward Gear, Where Icy Waves Have Broken Unobstructed

MARK Twain made the leadsmen who called the river depth under the Mississippi river packets famous, and the captains of Great Lake ore boats who sail their ungainly craft in fleets that are thicker than boulevard auto traffic, are not unknown, but there is one breed of sailors who are the strangest navigators of the seas, and almost unknown outside their own waters. They are the echo sailors of the inside passage from Puget sound to Alaska—navigators who pilot their ships through the darkest night by the echo of their fog whistles.

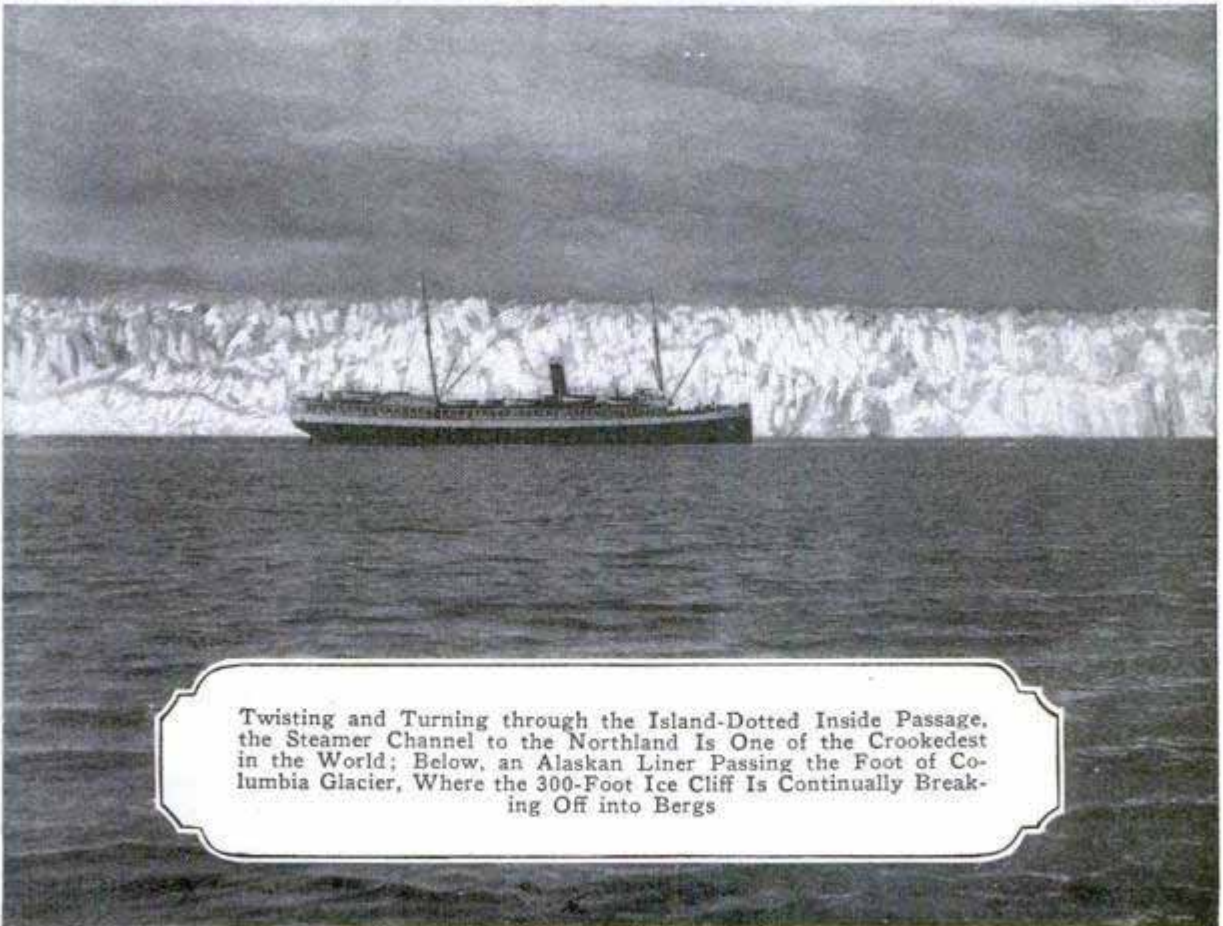
The inside passage to the Northland is more crooked than the famous dog's hind leg; a narrow tortuous channel, protected from the sea by mile after mile of mountainous islands, interspersed with narrow passages through which the tide rips at terrific speed. The incoming tide piles up vast quantities of water in the inner passage, and then, when it turns, all the excess must drain out through the infrequent openings, with the result that it races through many with the speed of an express train.

Up that crooked passage, protected for the most part from the gales of the open sea, the Alaskan steamers ply. Torrential rains, brought on when the warm air over the Japan current meets the snow-crowned mountains; thick fogs that settle in the narrow valley of the steamer channel, and, at the northern end, icebergs and floes, constantly breaking off from the terminals of giant glaciers, make navigating difficult.

It isn't safe to slow down and creep cautiously along, as a ship would do in the open sea, for the tidal currents require full speed in order that the ship may always be under full control and not slip sideways onto some hidden rock or low-lying sandbar. And full speed ahead—varied by full speed astern—is the rule of the echo pilots.

Take a look in the wheelhouse of an Alaskan steamer on a night when fog has blotted out the lookout's lantern at the jackstaff in the bow. Down below, in the social hall, the evening's dance has been stopped, for trained echo ears can't hear the fugitive sounds from ashore when the orchestra is going full blast.

1589



Twisting and Turning through the Island-Dotted Inside Passage, the Steamer Channel to the Northland Is One of the Crookedest in the World; Below, an Alaskan Liner Passing the Foot of Columbia Glacier, Where the 300-Foot Ice Cliff Is Continually Breaking Off into Bergs

The pilot stands with his hand on the whistle lanyard. When he pulls it down, a hair-raising blast blares out aloft, and in the wheelhouse the pilot, captain and two mates count the seconds until the echo, reflected by a hillside, comes back. In six seconds it returns. A pause, and another blast, short and sharp. Four seconds, and the echo arrives. A hand reaches to the engine control, shoves it over to full speed astern. A jingle of the bell confirms the order from the engine room, far below, the pulsing of the engines ceases for a moment, then throbs violently as the propellers churn the water. Again the pointer moves, and all vibration ceases, while the ship, checked in its speed, drifts slowly ahead.

The second officer, checking watch and log, calls off three minutes. The pilot pulls the whistle again, and in seven seconds the echo is heard, this time fainter because of distance, but unmistakably from a point slightly abaft the beam.

"Think we've cleared the point," the captain comments as he turns to the helmsman and gives the order for a new course, "north by east, seven-eighths east."

The helmsman repeats the order, the wheel swings down and the engine-room telegraph is thrown to full speed ahead.

The second officer, comparing his log with the log of a past voyage and intricate tide tables, jots down the entry and begins computing the next leg of the course.

Captains of the inside-passage liners must serve a long apprenticeship, including several years as pilot, before they are qualified to handle a ship. Each vessel, besides its regular officers, carries two pilots, whose sole duty, like that of the old-time Mississippi river pilots of Mark Twain's day, is to learn the course by heart and keep posted on every change. The cutting of a forest on a hillside will change the time of the echo, and even a derelict, or sometimes a floating log, will return an echo of the whistle blast. From Seattle to Skagway, one of the pilots is constantly on duty, with the exception of the twenty-four hour crossing of the open gulf after leaving the inside passage at Icy straits. Past the gulf, and around Cape Hinchinbrook, the pilots again stand trick and trick, while the steamer chases from mine to cannery among the islands and the glacier-bound inlets of Prince William sound.

Sailing by echo is based on the fact that sound travels about 1,100 feet a second, so that half the number of seconds between sound and echo represents the time taken for the return journey to the steamer. A four-second interval indicates shore at 2,200 feet, but does not necessarily mean deep water for that distance, for low-lying sandbars or hidden reefs may project far out under the water. Only intimate knowledge of the channel and accurate checking of the time each recognizable point is passed enable the pilot to tell by the echo



Back of Mount Fairweather Is a Passage Which Is Almost Continually Filled with Drifting Ice Floes, Wreckage of Glacier Terminals Carried In Here by the Shifting Currents

Andor nova 797
Hungarian artist

just where he is. Only one island on the whole route is too low to return an echo, and that is Minor island in the San Juan group, to the north of Puget sound. To meet the lack, a huge wooden reflector, like a twenty-five foot square signboard, has been erected on the island. It is a constant source of wonder to passengers who marvel that anyone should have erected it in such an out-of-the-way island, and then forget to paint a sign on it.

1742

MONUMENT FOR APPLE TREE SIXTY-THREE YEARS OLD

Because it is the parent tree of a variety and, although sixty-three years old, is still producing fruit, an apple tree at Peru, Iowa, has been honored by a monument. Last year, the tree yielded more than five bushels of sound apples. Tree surgeons are credited with keeping it alive. Periodically, the decayed wood of its trunk is removed and concrete filling applied, while most of the lower part has been rebuilt with steel members. The branches are kept pruned so that the roots will not become exhausted in supplying nourishment to useless twigs and leaves. A pioneer orchardist is said to have set out a tree of Bellflower variety in his garden in 1864. The young plant dwindled, but the seedling root remained and was grafted to another branch. As a hybrid it flourished, and after the death of the planter, orchardists sponsored the erection of a boulder monument in honor of the grower and the tree he developed.

at Winterset Iowa. 1319

AUTO TAIL LIGHTS OF RUBBER PROOF AGAINST BREAKAGE

Rear lights for the automobile in rubber cases, which can be squeezed, dropped and knocked about without fear of breaking, have been introduced in England. An additional feature claimed in their favor is that they are less likely to rattle than metal ones.



at Motor Show
at Olympia



Painting Design on Material for Evening Gown Worn by Model, so That Artist Can Harmonize Colors

HAND-PAINTED VELVET GOWNS LATEST FASHION NOVELTY

Designs painted in quick-drying colors on velvet gowns have become popular in New York. The tints are of chemical preparations said to be permanent. The scheme permits distinctive effects which it hardly would be possible to achieve in stock materials.

FISH ARE COOKED IN JACKETS? TO PREVENT ODORS

Wrappers of a transparent material have been devised for use in cooking fish to prevent filling the house with odors. They also protect the fish from dirt in the markets, yet allow inspection before the purchase is made. The wrapper is removed after the contents has been prepared and helps keep the fish from breaking and in good condition for serving.

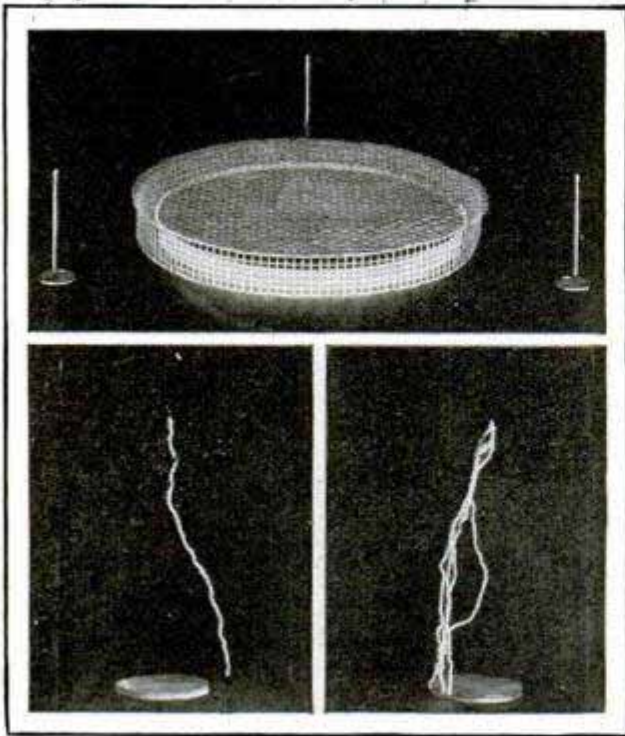
E. A. du Pont
de Nemours & Co.

du Pont Cellophane Co. New York
40 W. 40th St.

Feed

1246798

Experimental Laboratory, Applied Psychology



Courtesy General Electric Co.

Model of Tank with Poles; Below, Right, Unprotected Tank Struck by Lightning

PROTECT OIL FROM LIGHTNING WITH POLES AND SCREEN

From experiments made with artificial lightning, engineers have learned how oil-storage reservoirs can be protected both from direct hits and induced voltages, which may come from a lightning flash striking at a distance. It was found that a pole or conducting rod protects from lightning an area within a circumference four times its height. Tests showed that the bolt struck one of the poles around the model tank or hit at some distance from it. By means of a wire net, or screening, covering the top and extending slightly over the sides of the model, induced voltages which might cause sparks and ignite the explosive gases in the tank were prevented. An all-metal tank affords the best protection from lightning, but such units are not

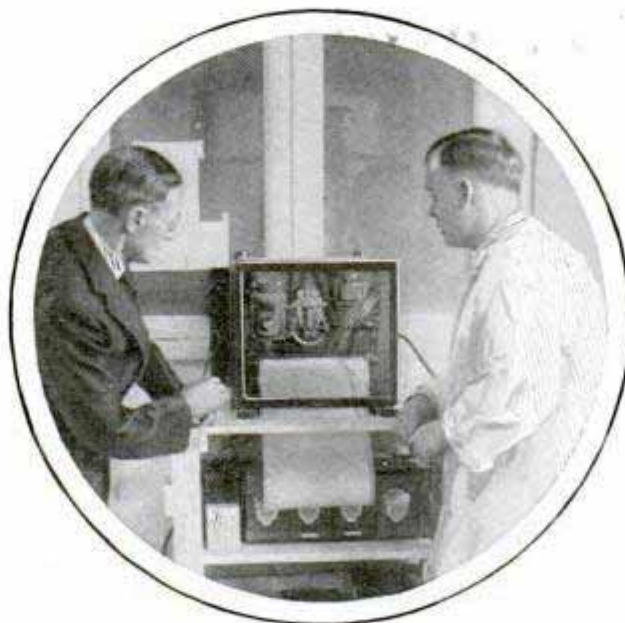
always practical. Gases forming between the top of the oil surface and the bottom of the lid of the tank present a hazard, for a spark at 500 volts, caused by a lightning bolt striking miles away, is sufficient to cause an explosion.

METAL IN "SHENANDOAH" POOR 1816. X-RAYS INDICATE

Minute studies by X-rays of metal sections from the "Shenandoah" have led Prof. George L. Clark, of the Massachusetts ~~institute of technology~~, to believe that defects in the framework were the real cause of the dirigible's collapse in the fall of 1925. Prof. Clark states that his investigation places no responsibility upon the manufacturers of the metal or of the ship, for he believes the poor spots that have been detected could not have been revealed under methods of X-ray examination as practiced when the dirigible was built. Furthermore, it is not known whether the defects were due to improper treatment during the manufacture of the alloy or to subsequent effects of the weather and of vibration.

THIRD OF SUN'S RAYS CUT OFF 1711 BY CITY SMOKE

Besides being unpleasant and a cause of added expense because of the extra cleaning it necessitates, the pall of smoke that hangs over the city is regarded as a menace to health not only on account of its effect on the lungs, but because it keeps out some of the beneficial ultraviolet rays of the sunshine. This has been made more apparent by a special gauge which indicates, by a line traced on a ruled sheet, how much sunshine reaches a given spot. Tests have shown that thick smoke may cut off as much as one-third of the rays.



Sun-Measuring Gauge Which Indicates How Smoke Cuts Off Healthful Rays of Sunlight

Mr. James E. Jones and

HOW ENGLAND KEEPS TOMMY ATKINS FIT TO FIGHT



Royal
Napoleon's Dictum That a Soldier Marches on His Stomach Is Heeded at the British Army Medical College; Above Is a New Pocket Ration, Superseding the Famous Iron Ration of the Past, and, at the Top, a Hygienic Camp Layout



The Energy Contained in Various Forms of Rations Is Tested on an "Ergometer," Which Is a Bicycle with Recording Instruments to Show the Work the Rider Can Do after Each Type of Meal; at Left Are Army Chemists Testing Milk for Butter Fat



J. Clyde Dakin, Gavel Maker to Congress, at His Lathe; the Huge Gavel Is the One Presented to the Late "Uncle Joe" Cannon

MAKING GAVELS FOR CONGRESS MAN'S UNIQUE JOB

So many gavels are broken during the sessions of congress that an expert lathe operator is kept busy part of the time, in a shop in the basement of the capitol, replenishing the supply. He fashions new ones and repairs the old if they are not too badly damaged. He was commissioned to turn the huge gavel that was presented to the late "Uncle Joe" Cannon by Texas admirers during his last term as speaker of the house.

USE OF DRY ICE IN FRUIT CARS CUTS SHIPPING COSTS

Successful production of carbon-dioxide snow in compressed bricks for refrigeration promises to effect considerable savings in the shipping of perishable fruits and vegetables by train, besides keeping the shipment in better condition. Two hundred pounds of the snow can replace 3,000 pounds of water ice and 600 pounds of salt in the shipment of a car load of ice cream from New York to Philadelphia, releasing that much more space for paying freight. In a shipment of frozen fish from New York to Detroit, 17,000 pounds of water ice and 1,700 pounds of salt are

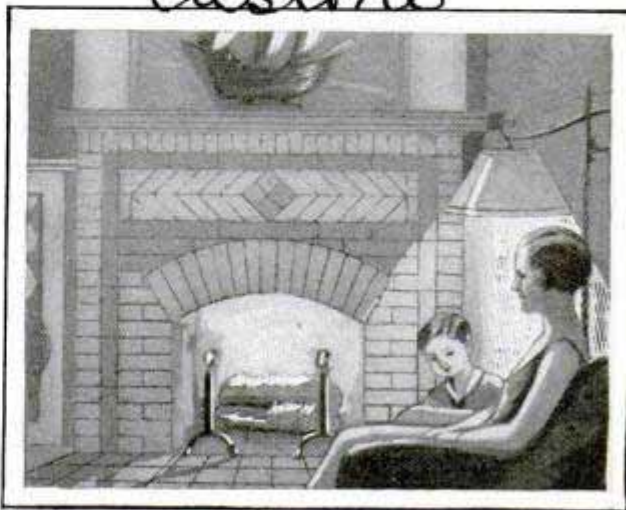
needed, whereas 1,200 pounds of carbon dioxide will take their place. The difference is due to the extremely low temperature of the dioxide snow, which melts at more than 150 degrees below zero. Another important advantage is that carbon dioxide, being a gas, disappears into the air as it evaporates, instead of leaving a pool of water behind. In evaporating, the intensely cold gas, pushing up through the car, not only carries off the heat that leaks through the insulation, but likewise removes the stale air and the odors of the freight cargo, exhausting them through

ventilators at the roof level. Carbon dioxide is more commonly known as carbonic-acid gas, and is the familiar charge in soda water and all effervescent drinks. Unlike monoxide, it is not poisonous.

FIREPLACES OF CAST STONE 1100 INSTALLED IN HOUR

Ornamental fireplaces that can be installed in an hour or so, are furnished in various color combinations and designs to harmonize with the interior. They can be adapted to gas or electricity, and it is not necessary to cut the floor to fit them.

Cast Stone



Unit Fireplace of Cast Stone as Installed; It Is Made in Various Patterns and Color Schemes

*Fireplace Mfg Co
2144 John R St.*

*U. H. Killefer, Secretary
Chenier
1840
New York section, 52 E 41 St New York*

Great Britain's Latest Guardian of Vessels against the Perils of Fogs, Lightship "Royal Sovereign" Equipped with Submarine Oscillator and Radio That Sends Additional Warnings



7 miles off Eastbourne

LIGHTSHIP SENDS RADIO RAYS WHEN FOG STOPS LIGHT

Modern inventions have necessitated changing styles in vessels, a fact well illustrated in the "Royal Sovereign," the new British lightship which has taken the place of the old boat. It is equipped with a powerful electric light, submarine oscillator, wireless and has a larger crew. Its radio outfit makes it doubly useful, since it can warn other vessels even if the light is not visible.

slightly corroded. The paint, however, had almost entirely disappeared owing to chemical action. One of the most surprising features of the inspection was that the building showed the greatest stability just where the "experts" had predicted there would be the most decay, that is, in parts surrounded by or incased in mortar.

LIFT FOR RAISING AUTOS SAVES PUMPING UP JACK 155 3

Using the ordinary jack to elevate the automobile is generally a troublesome task, especially when the roads are soft *\$4.50*



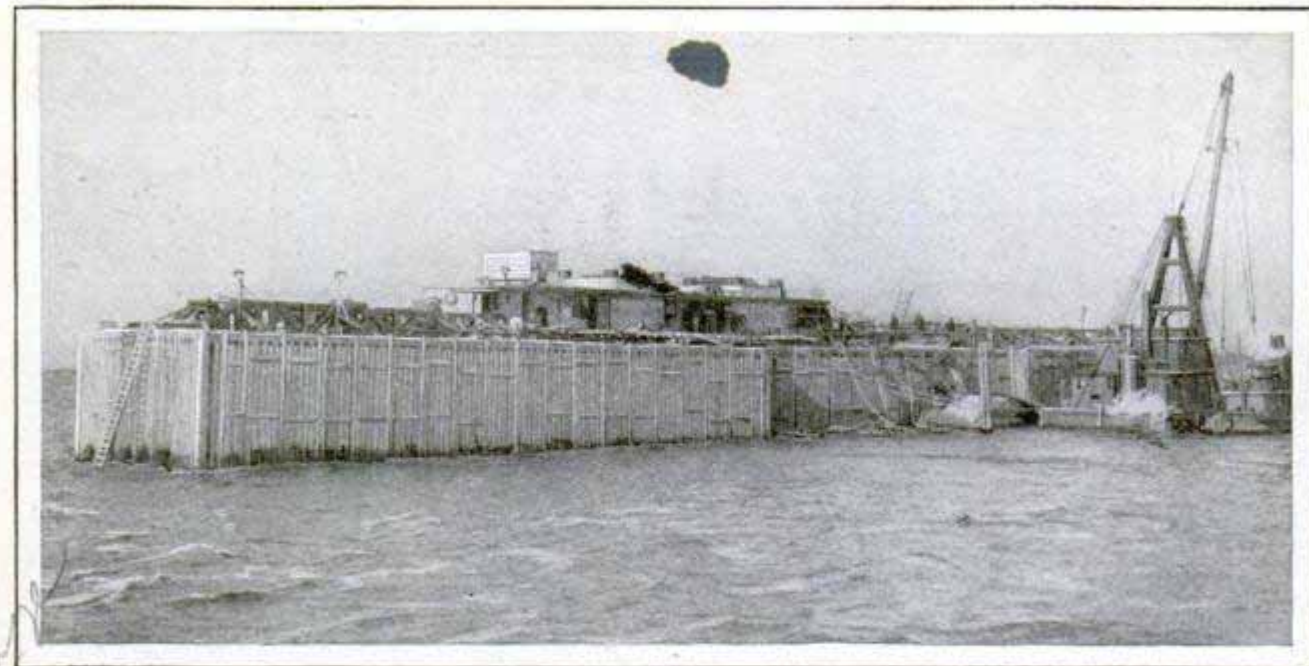
and the weather unpleasant. The work has been simplified by a folding lift which elevates the car after the auto has been run upon it under its own power. The jack can then be inserted and the lift collapsed, leaving the car wheel raised for mending or changing tires, fixing brakes or other repairs.

HOW SKYSCRAPER RESISTS RUST SHOWN IN OLD BUILDING

Wrecking of one of the first skyscrapers erected in New York city proved interesting to engineers, who had contended that no steel frame could possibly escape rust and that, sooner or later, a building of such construction would collapse from this cause. Examination of the members of the New York structure showed that they were in excellent condition after years of service. There was no indication of rust on the beams and girders themselves, although some of the rivets had

*Cont. Edwin Larisse
for the Harragut*

*E. H. Finch Co, Inc
1476 Broadway*



The "Washington Irving," Raised and Surrounded by Cofferdam Preparatory to Towing Ashore to Repair Damage Caused by Wreck; Ship Is Largest of the Hudson River Day Line

SHIP SUNK FOR EIGHT MONTHS RAISED BY COFFERDAM

After being submerged for more than eight months, the steamer "Washington Irving" was successfully raised and towed ashore off Bayonne, N. J. Engineers accomplished the work by constructing a large cofferdam about the ship to help float it so that it could be beached.

SNOWPLOW HAS ROTOR BLADES TO HELP CUT DRIFTS

Many snowplows of the ordinary "pusher" type have distinct limitations since

they often pile the snow higher as they proceed, increasing the pressure and weight and forming larger drifts which may do serious damage to the roads when they melt. These difficulties are said to have been eliminated in a plow that has a powerful revolving set of blades on either side. It cuts as it shovels and throws the snow far to right and left so that it can be operated in wet, packed or frozen snow of great depth, whether level or drifted. An additional advantage is that only one side rotor can be run at a time if desired. This is considered especially helpful in removing banks that have been piled up with ordinary push plows.

The outfit is made in various sizes, one model being adapted to operation by small tractors.

IMMIGRANT GIRL LEARNS ENGLISH BY LISTENING TO RADIO PROGRAMS

Four years ago, a young Russian girl arrived in this country, not knowing a word of English. Today, she is able to speak the language quite fluently, having learned it largely by hearing the words of the radio announcers and entertainers from a receiving set her brother purchased. She is now employed as cashier by a radio company.



Rotor Snowplow in Action, Showing How Revolving Blades Hurl the Drifts Away to Prevent Packing

The Rotary Snow Plow Co.
529 Second Ave. S.
Minneapolis, Minn.

Miss Marion Isordm.
employed by American
Radio Co.

1416 Melrose St. Kansas City, Mo.

MAGIC with MATCHES

By WALTER B. GIBSON

45th and Spruce

EVERYONE should know a few good tricks with matches, because a match box and its contents may be used in a host of interesting impromptu mysteries, providing many moments of entertainment.

A novel and interesting experiment may be performed with the cover of a match box. The trick is to form a six-sided box, that will contain a penny. When the coin is in the box, it must be entirely inclosed.

Cut the cover crosswise into three equal sections. Push one of the sections through another so that their opposite corners touch. There will then be space for the third section. Press the third section flat; place the coin in it, and slide it through the other two. When the section is straightened up, you will have a solid hexagonal box with the coin inside.

The "restored match" is an old trick with a new method. A match is wrapped in the center of a handkerchief, and is broken through the cloth. When the handkerchief is unfolded, out drops the match—unbroken.

In the old version, a duplicate match was concealed in the hem of the handkerchief. The duplicate match was broken through the folded cloth, and, of course,



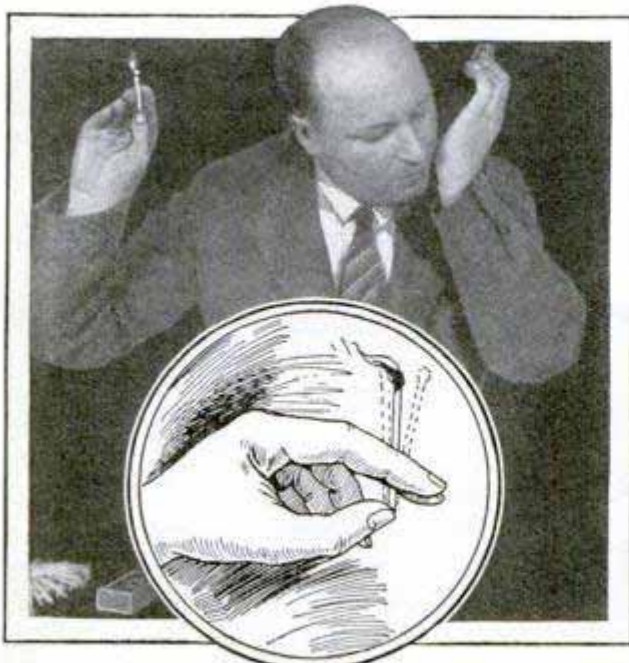
Tall Stacks of Match Boxes Are Built Up by Pushing the Drawer of Each Slightly into the Next

the original match was undamaged. You can still perplex people with the old trick, especially if you have two matches hidden in the hem, so that you can repeat. In case someone is suspicious about the handkerchief, you have the new trick, which may be done with a borrowed handkerchief. The match is broken through the cloth; people can hear it snap, but it comes from the handkerchief whole.

In this case, the original match is actually broken; no duplicate is used. But it is easy to break the match without completing each break. When you do this through the cloth, people can hear the match snap; but you have only to press the match back into its original shape, and when you unfold the handkerchief, it will fall on the table, apparently restored.

Smashing the match box is a real tantalizer. Take an empty box, set the cover on its side, and stand the drawer upright on the cover. Then invite a person to smash the box with a blow of his fist. The harder he hits, the less successful will he be. As his hand descends, it will send the two portions of the box flying in different directions, but neither will be broken.

It is well known that safety matches



Putting Out Match by Blowing up the Opposite Sleeve; the Flame Is Really Snapped Out by Thumb Nail



One Solution of the Problem of Forming Five Triangles with Only Nine Matches, an Interesting Puzzle

cannot be lighted except on the box side. Nevertheless—if you know the trick—you can quietly strike them on the sole of your shoe and get a light every time. A bit of preparation is necessary. Rub the side of a match box vigorously against the sole of your shoe, at the instep. Some of the striking material will remain on the shoe, and will not wear off for quite a while, although it will not be noticeable. You can strike a match there without difficulty.

When a friend asks for a light for a cigar or cigaret, try this little stunt: Hold the match between your thumb and first two fingers, and break it in two by pressure with your thumb. Then hold the broken pieces together between the thumb and forefinger. Your friend is not expecting a trick, so he is not likely to notice what you have done.

Strike the match and hold out your hand. Your friend, in taking the match, will naturally grasp the unlighted end, and will carry it to his mouth. To his surprise, he will find that he has nothing but half a match, while you are calmly lighting your own cigar with the missing light.

Another trick is that of blowing up your left sleeve and immediately extinguishing a lighted match held in the right hand. The right hand puts out the match, but in an undetectable manner. Hold the match between the first two fingers of the right hand so that only a tiny tip projects within the fingers. Place the tip of your thumb, or the thumb nail against the end of the match, and snap it. The match will suddenly go out. At first the motion of the match will be noticeable, but as you become more proficient, you will be able to accomplish the trick with a very short, quick snap. The action of blowing up the left sleeve only serves to divert attention from the right hand.

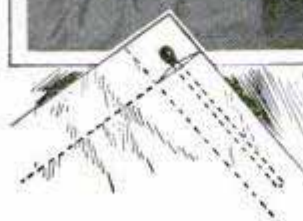
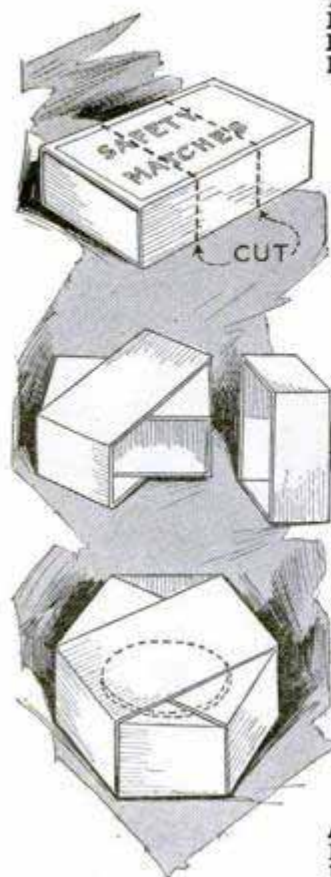
A neat trick, which appears to be a feat of juggling, is the balancing of three or four match boxes, one upon the other. This appears to demand genuine skill, but very little dexterity is required. In setting each box in position press up the drawer of the bottom box, so that this drawer slightly engages the cover of the box above it. This gives stability to the stack, and the boxes will stay together even though they are tilted at a precarious angle. When the stack is dropped to the floor, the boxes will, of course, come apart.

There is an interesting trick whereby you can apparently demonstrate that matches respond to a form of magnetism.



Lay a match on the table, and lean another match across it, so that the head is tilted upward. Then take a match box, and draw it slowly by the head of the cross match. The match will move, the head following the box, as though the matches in the box acted as a magnet. The secret is artful. As you lean forward, and everyone watches the matches, blow gently on the blank end of

The Three Sketches at Left Show How to Cut a Match Box to Form a Six-Sided Box in Which a Coin Can Be Concealed; Those at the Right Show the Trick of Holding a Box Upside Down without Spilling the Contents, Until the Brace Is Released



MATCH BROKEN
MATCH RESTORED

Above Is the Explanation of the Broken Match Which Reappears Whole; One Match Is Folded within the Handkerchief, but When It Is Presented to Be Broken, You Offer One That Has Previously Been Concealed in the Handkerchief Hem



the cross match. The slight breeze will cause the head of the match to apparently follow the box of its own accord, as though attracted by an unseen force.

Having thus demonstrated the attractive force of magnetism in matches, you can proceed to show the opposite activity. Take the two matches and set them side by side on the table, but about six inches apart. Then draw the match box between them. As you do so, blow on the table between the matches, and they will suddenly spring away in opposite directions.

Try this trick with a dozen matches. Lay them in a row on the table, and, while your back is turned, ask a person to move several matches, one at a time, from the right end of the row to the left. When he has done so, you can look at the matches, and tell how many he has moved. All you have to do is to center your attention on one match that has some tiny peculiarity by which you may recognize it. You should have ready in your pocket a match that has a nick in the end, so small that no one will notice it, but large enough for you to observe it. Note the position of that match in the row, counting from the left. After the person has moved a few matches

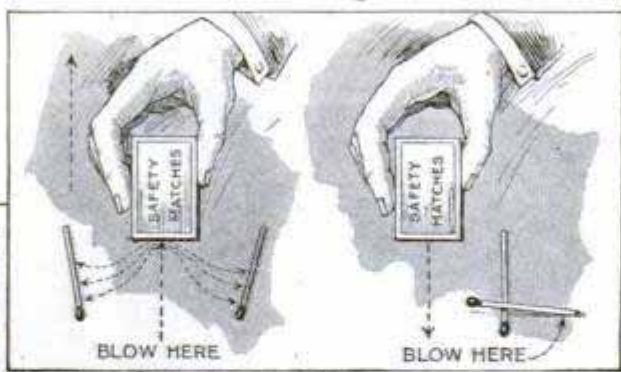
from right to left, observe the new position of the match, and by simply subtracting the old number from the new, you can tell how many matches have been moved.

The "jumping match" bears a similarity to the trick of "blowing up the sleeve," but the appearance of the trick is quite different. A match is held between the thumb and forefinger of the right hand. The knuckles of the finger rest upon the table. Then a second match is leaned across the first. With no apparent motion of the match in the hand, the leaning match is caused to fly up in the air. The third finger of the right hand does the trick. It presses against the inner end of the match and snaps it. The thumb and forefinger hold the center of the match very firmly, and virtually no motion can be seen, yet the power is great and, after the knack has been acquired, it will project the leaning match six or seven feet in the air. The left hand should be placed upon the right, as though to steady it. This will hide the motion of the right third finger, when it goes into action.

Last of all is a mysterious trick that involves both the match box and its contents. The drawer of the box is pushed part way

open, and is shown to be filled with matches. The box is turned over and the drawer is removed from the cover. Although the drawer is inverted, not a single match falls from it,

the box is inverted, the drawer may be entirely removed, and held upside down, between the tips of the thumb and forefinger. The wedged match prevents the others from falling.



Demonstrating Attraction and Repulsion of Magnetism by Making Matches Move toward or from a Box Drawn Past Them; the Secret Lies in Blowing at the Right Time and Place

until, at your command, all the matches drop in a heap on the table. Both the box and the matches may be examined.

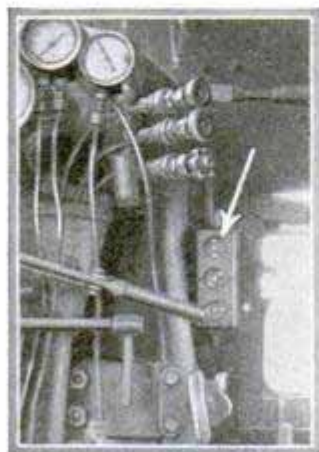
In preparing for this trick, take a match and break it off to a little more than half its length. Use this piece as a wedge, inserting it across the center of the drawer, which should be about half filled.

When the drawer is partly opened, the wedged match will not be seen. But when

After a few moments, place the tip of your second finger under the drawer, and push the wedged stick away. The matches will fall in a heap on the table, burying the stick beneath them, so its presence will never be known. If the stick is not wedged too firmly, it may be released by simply pressing the sides of the drawer, but by the insertion of the finger you will be more sure that the trick will not fail.

ROADSIDE SIGNALS ARE SHOWN IN ENGINE CAB

Roadside signals are repeated in miniature in the engine cab, under the eyes of both the engineer and fireman by a new safety device adopted by the Pennsylvania railway. Fog, snow, sleet or rain may obstruct the engineman's view of the roadside signal until he is very close to it, but now he will have the little sign in the cab and the "toot-toot" of a small



whistle to attract his attention. Not only does the engineer see the signal, but he must acknowledge any change in the indication, for another device in the new automatic-control system keeps tab on him. If he ignores the signal and warning whistle, the brakes will be automatically set and the train cannot be started again until he gets down out of his cab and releases the brakes. This is accomplished by turning a valve which can be reached only when standing on the ground alongside of the locomotive. The new train control is operated by electricity. The rails are hooked up with the automatic block-signal system, and when a train is running along in a block, a continuous electric current flows down one rail and up the other. It is picked up by two shoes on the locomotive and carried to an instrument box that operates the signals.

Emb. Louis J. Henderson, 525 Chicago Station Chicago

MINISTER'S SON BEST SCHOLAR YALE RECORDS SHOW

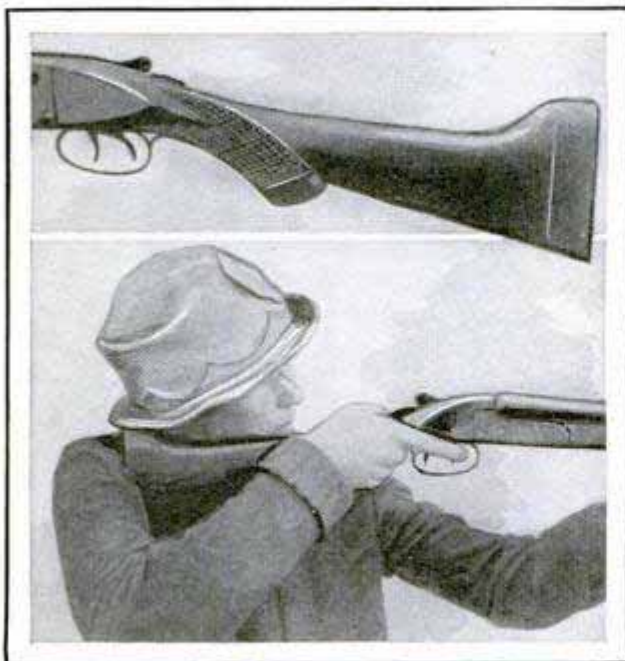
1854

Sons of clergymen excel in scholarship at Yale, according to reports published by the bureau of appointments of that university. Their average was 79.6 per cent. Lawyers' sons were next with 75.9; sons of doctors third with 77.3; teachers' sons next with an average of 77.1; business men's sons followed with a rating of 76.1, while sons of scientific and engineering parents received an average of 75.8. The study was made for a total of 1,346 cases, of which 799 were the sons of business men and twenty-nine of clergymen. Twenty students, studying politics and diplomacy, had the highest mentality rating.

GUN FOR LEFT-EYED SHOOTER AIDS MARKSMANSHIP

1632

Men who have learned to shoot with a rifle often have trouble with a shotgun. This is frequently due to the fact that they are unaccustomed to keeping both eyes open when aiming, and there is a tendency to line the gun up with the stronger or "master" eye, which often is the left. To remedy this difficulty, a special stock has been devised. Its top is cut down so that the user can see over the lowered portion, easily placing his left eye in line with the rib of a double-barrel gun or back of the center of a single-barreled one.



Gunstock Cut Away for Better Aiming and Illustration of Its Effectiveness in Firing Position



John Charles Thomas, Concert Singer, at the Mouthpiece of the Airplane Transmitter

"VOICE FROM SKY" TO REACH THOUSANDS FROM PLANE

Concerts from the skies are now possible through amplifying equipment in an airplane. Tests have shown that speech, song and instrumental music can be distinctly heard from a moving plane at an altitude of one mile by listeners on the ground. Every syllable, word and note were clearly distinguished, according to reports. It is expected that the apparatus will be of great aid in spreading special news and announcements, since the auditors need no apparatus of any kind to help them receive the messages.

RICHES FOUND IN STRAW SMOKE BY CHEMICAL PROCESS

184

Useful products to the value of \$250 have been taken from the smoke derived from a ton of straw by processes an eastern chemist has employed, according to reports. A new germicide, a roofing and damp-proofing paint, and a fly spray were among the substances extracted. Gas for running automobiles could be obtained from the material, although the method, in its present development, would not be practical, the chemist declares.

from Farm and Fireside

Atthaca Iron Co.
Atthaca NY

George H. Harrison

1690
1791
Am. J. Keeney
Box 7, Santa Calif

*Ent. Jack A. Bristol, 114 U. P. Bldg
Amaha nebr*



Examining the Rain Gauge at Death Valley Weather Station, 178 Feet below Sea Level

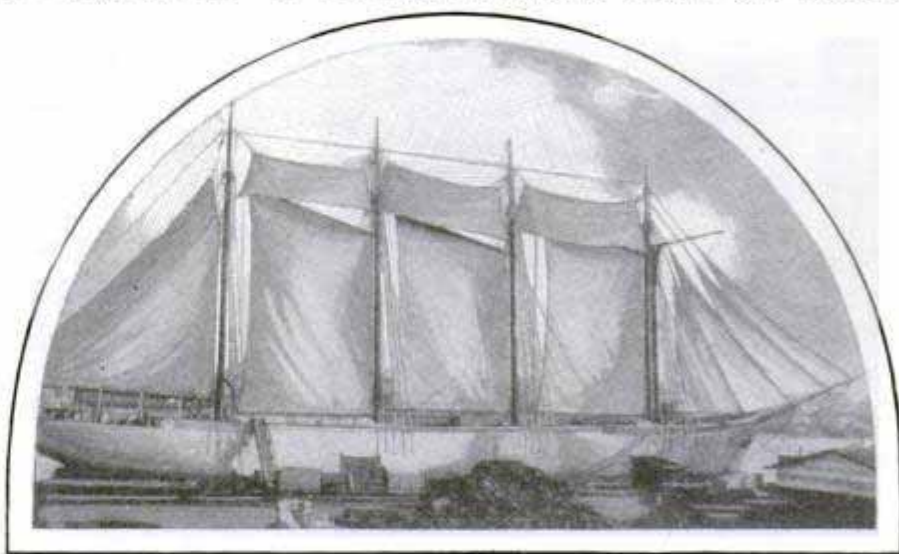
"FAIR AND HOT" DAILY WEATHER AT DEATH VALLEY STATION

Three hundred and fifty cloudless days a year, summer temperatures 160 degrees and higher in the sun, with eighty degrees the average in January, such are the weather conditions at the observation station in Death Valley, Calif., 178 feet below sea level. The rainfall is less than half an inch yearly. When the station was first established, it was equipped with a thermometer graduated to only 140 degrees. In its shaded house, it rose to 137 degrees. Someone took it out in the sun. In a few moments it burst, and the official record was never completed. A new thermometer registering as high as 180 degrees has been provided and a mark of 167 degrees, said to be the highest recorded officially at any spot on earth, has been taken. To keep accurate track of the precipitation, the observer must be on the alert, for the gauge dries up between times and he must obtain readings as the moisture falls. The station stands near Furnace creek.

AMERICAN SAILING SHIPS STILL SEARCH SEAS FOR TREASURE

master of

American sailing ships still find it profitable to search the out-of-the-way spots of the world for rich cargoes, as witness the voyage which the big four-masted schooner "Aneiura" recently started from San Francisco. The vessel is fitted with twin Diesel engines capable of driving it along at seven miles an hour when the wind fails, so that a round trip to Australia and home by way of South America is planned to take but five months. In addition to the Diesel engines, it carries a steam boiler and hoists, to handle the cargo and anchors, and gasoline engines on deck do all the heavy work of handling sail. As a result of the use of power, the crew needed to handle the big ship, with a 2,000-ton cargo, is but fifteen men. Outbound from San Francisco, the "Aneiura" carried lumber for Australia, where she will load coal to the west coast of South America, and will then call at Ecuador for balsa logs—a wood of about the same weight as cork—and at the Galapagos islands to fill her holds with barreled whale oil and sulphur. Like the clipper-ship captains of old, who conducted business all over the world, Capt. Thomas J. Keeney, the "Aneiura's" skipper, plans to investigate a new shark industry in Australia, where skins are worked up for leather, part of the meat used as food, and the rest reduced to oils and chemicals, and, if the process

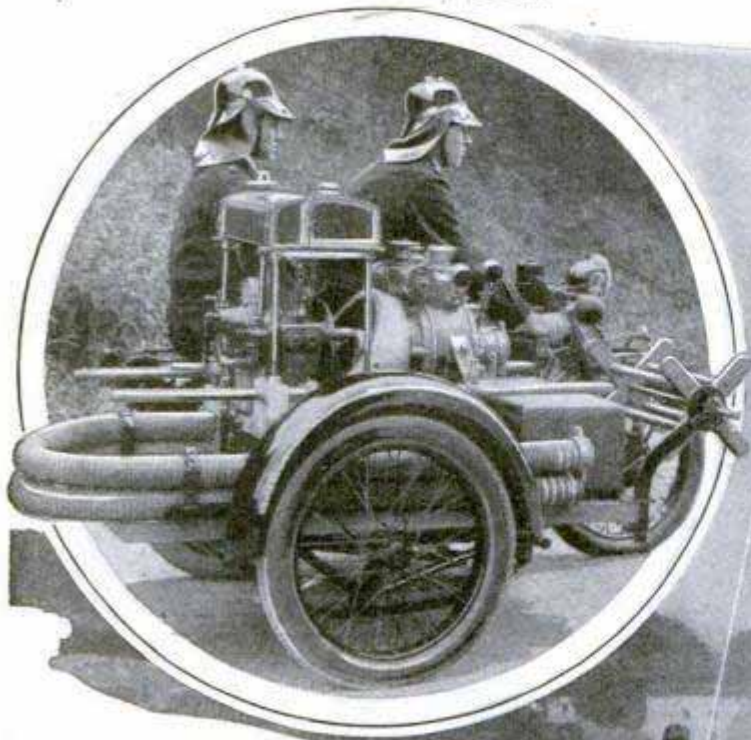


The Four-Masted Schooner "Aneiura," Which Is Equipped with Diesel Engines to Keep Her Going When the Wind Fails

is a success, introduce it in Ecuador, where the shark supply is plentiful.

MOTORCYCLE FIRE ENGINE SERVES SMALL TOWNS

*Es m. b. H₃
Ulrich a. d. Slonau
Schillerstr 2
Germany*



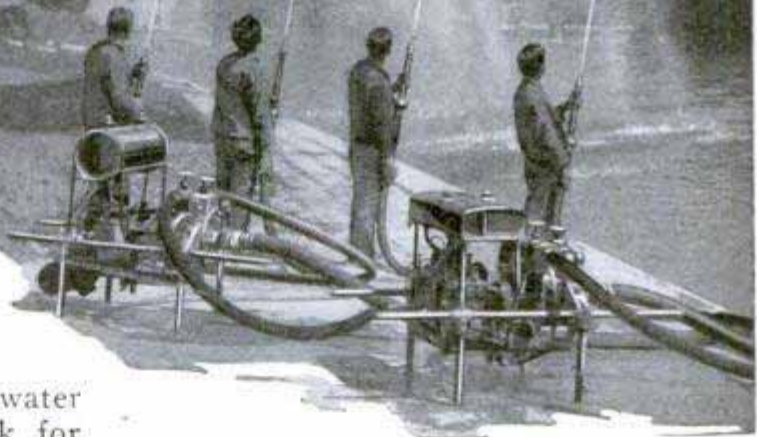
Cycle Fire Engine Ready for
2 Run, and Demonstration of
the Pumps

Designed especially for small communities or for industrial plants, a fire-engine unit can be carried on a motorcycle sidecar or other vehicle, is quickly set up and throws about seventy-five gallons of water a minute. There is a reserve tank for extra fuel, affording sufficient for four hours' continuous pumping. It is operated by a two-cylinder gasoline motor. A water-cooling system, air preheater and automatic lubrication are additional features of the outfit.

CITY CURRENT WARMS BUSES
WHEN MOTORS ARE IDLE

Electric car heaters have been installed on some of the motor busses in New York city. They are plugged into the city-lighting circuit at stop-over points to keep the interior warm, when the motor, which supplies heat from the exhaust on runs, is idle. Another innovation is the use of immersion-type heating units in the water jackets and crankcases of the engines, to keep the water and oil heated when the motor is not running, thereby facilitating

*Consolidated Car Heating Co.
Albany, N.Y.*



starting. These units are also furnished with current from the city circuit.

OVAL-DRAWING GUIDE SAVES
ARTIST TIME AND WORK

For artists, engravers, photographers and others who do much drafting, an adjustable guide for drawing or cutting ellipses does accurate work with an economy of time and permits a wide variety of designs. It consists chiefly of an off-center pivot and a rule on which the marker or cutting knife may be placed to leave an oval of the required size. After setting, the guide is used like a compass.

\$2.50 \$5.00



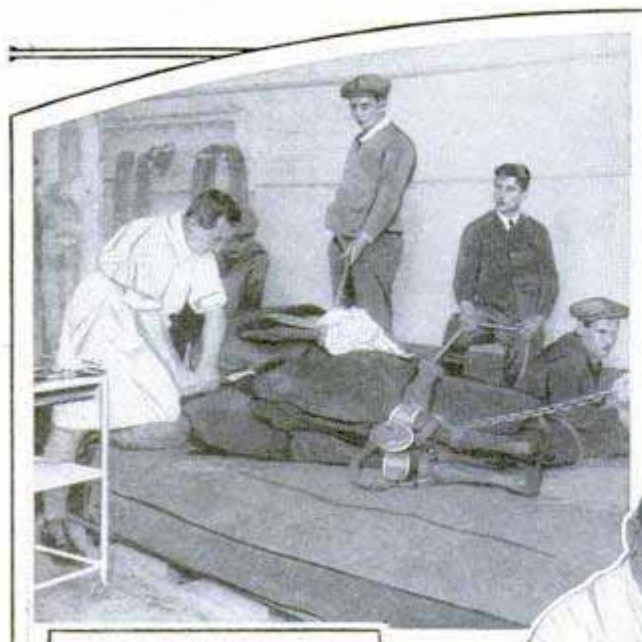
*Victor Ellipse
Graph*

1739

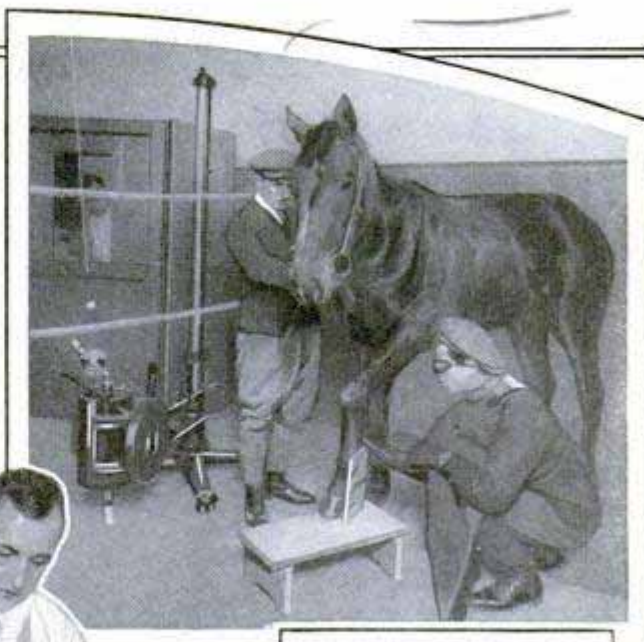
*Victor H. Spiller
53 Warden St.
Boston, Mass*

*Dryd Car Coach
New York City*

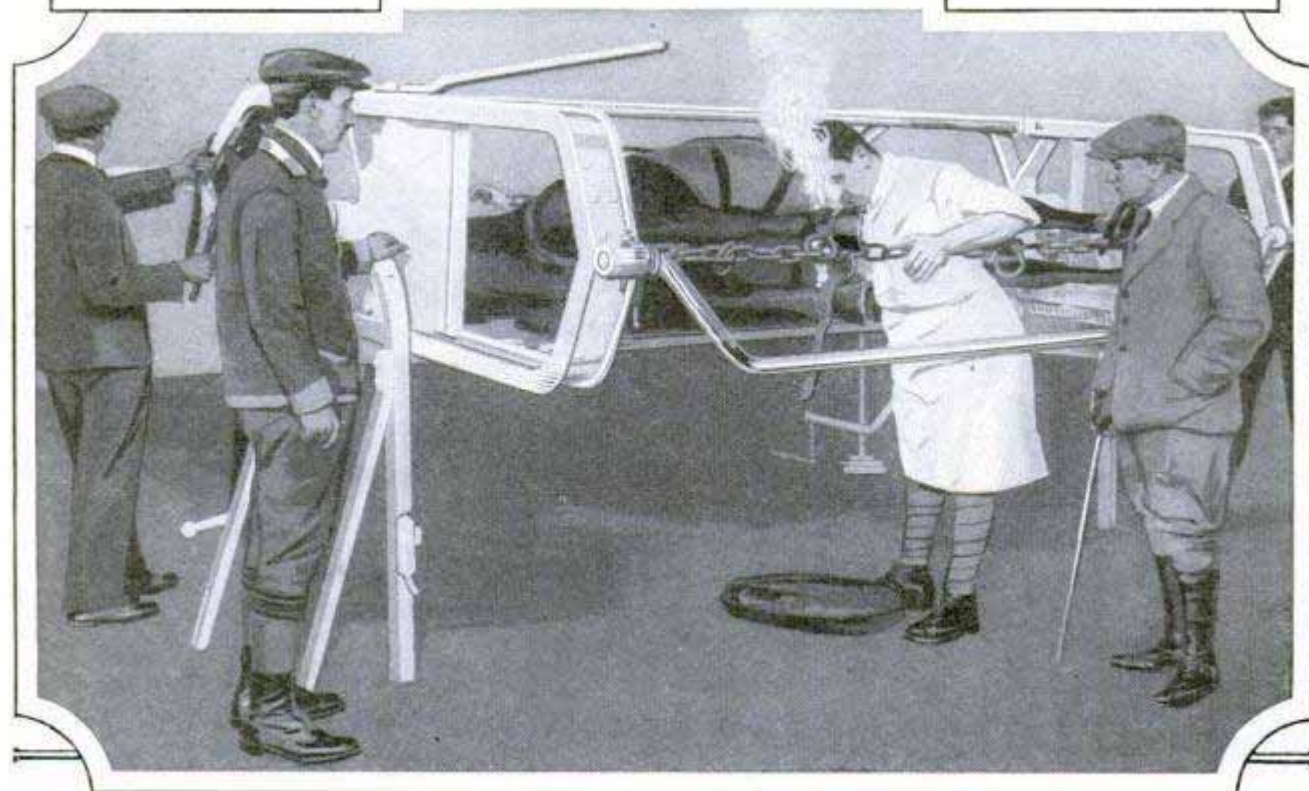
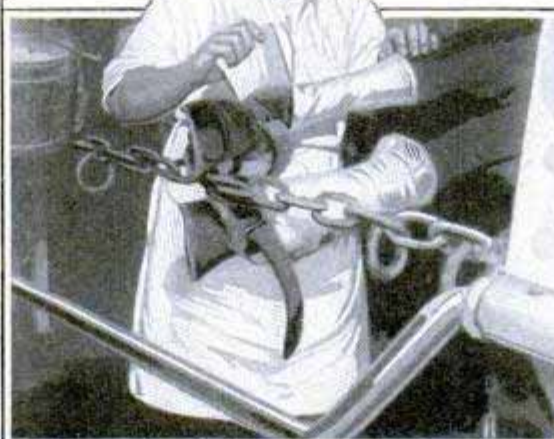
1515 A MODERN HOSPITAL FOR TREATING RACE HORSES



Where Race Horses Receive the Care of Skilled Veterinary Surgeons with Modern Instruments; Views inside a Horse Hospital in Germany; Above, the Big Padded Mattress on Which Shackled Horse Reclines during Operation, and, at Right, Placing Bandages on Legs after Treatment of Tendons: "Patient" Is Placed on Special "Operating Table"



Above, Giving Horse the Benefit of One of Man's Most Effective Surgical Aids, the X-Rays; Taking Picture of Horse's Foot to Reveal Inner Conditions; Below, Treating Tendons, a Common Source of Ailments and Break-downs, Especially in Race Horses; Operating Frame on Which Chloroformed Horse Lies Can Be Adjusted to Many Different Angles



Andover, Mass
POPULAR MECHANICS
Director of Dept. of American Archaeology 811
SECRETS OF ANCIENT RACE
SOUGHT IN GEORGIA 1842

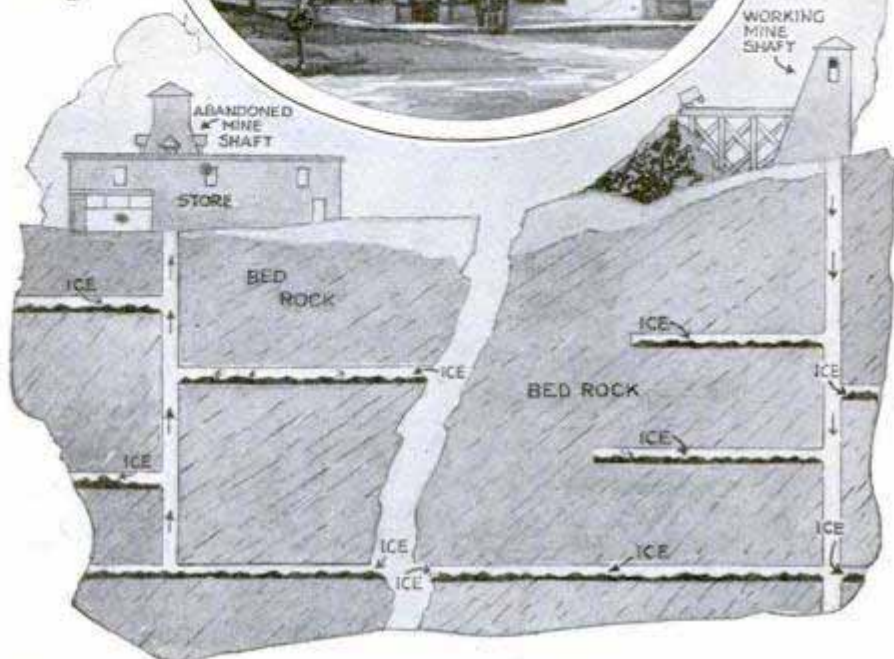
Search for copper plates, on which is believed to be inscribed the secrets of a mysterious people, is being made in the red-clay hills of Georgia, where DeSoto probably marched his men nearly 400 years ago. Fragments, bearing designs which cannot be translated until the missing pieces are discovered, form the basis for the hunt. Three mounds, already opened, have yielded human skeletons, shell beads, pieces of textile material apparently woven, pottery and broken implements. The mounds apparently were not constructed by Indians who inhabited the region 100 years ago, and much of the art work found resembles that of the Mexicans. It is believed that some of it had its origin in Honduras. The skeletons were inclosed in vaults of hewn stone somewhat like those used for that purpose today. The remains were found arranged in tiers, which were separated by layers of clay.

HAT PROTECTOR FOR RAINY DAY
FITS IN HANDBAG 1753

Folding up into an attractive little rosette that resembles a flower and may be carried in the handbag, a rubber shield for women's hats is quickly slipped on when sudden showers are likely to damage the headdress. It sheds the rain, drapes itself neatly about the hat and is made in becoming colors. Unfolded, the protector is so large that the user need not remove her hat to put it on or take it off.



Adjusting the Hat Shield, and Its Appearance When Folded Up into Tiny Rosette



Exterior of the Store and Diagram Showing the Mine Shafts with Ice Formations That Supply Cold Air

OLD MINE IS REFRIGERATOR
FOR FOOD STORE

Icy air from the depths of an abandoned silver mine in northern Ontario, Canada, keeps food supplies fresh in a store which has been built around the entrance to the old shaft. A constant low temperature is maintained for fish, vegetables and other articles. During the warmest weather, the plant does not register above thirty-eight degrees, though the thermometer may show ninety in the shade outdoors. The supply of cold air is so plentiful that the proprietor can afford to leave the doors of the refrigerators open during the summer season whenever he finds it desirable to cool his store.

1260.

Cobalt

*Cont. John Landels Ltd., Toronto, Canada
 3 Webb Ave. Toronto, Canada*

Everett Rubber Corp
825 Pershing Square Bldg
New York City

WOLF RIDE ON AIRPLANE WING LATEST FLYING THRILLER

Having performed many other hazardous stunts while riding on the wings of a

Pilot Bob Lloyd

out the threatened sections what to do to check the pests. Under the old system of bulletins, the growers would have had to wait weeks before the pamphlets could have been printed and distributed. The radio has brought the farmer closer to the department of agriculture and has greatly

Seeking Something Different to Afford a Thrill; Young Woman Stunt Performer with Wolf on Top of Airplane; the Animal Behaved Gently, but Scratched the Wings with Its Claws



Miss Gladys Dingle

moving airplane, a young California woman thought little of taking a wolf with her on one of the flights. The animal was controlled by a leash and the woman had a revolver in case protection of firearms should be needed, but she did not have to use it. The wolf was chiefly interested in keeping its balance, as shown by the fact that holes were torn in the fabric where it dug in its claws.

RADIO ADVICE HELPS FARMERS WAR ON CROP PESTS

1853

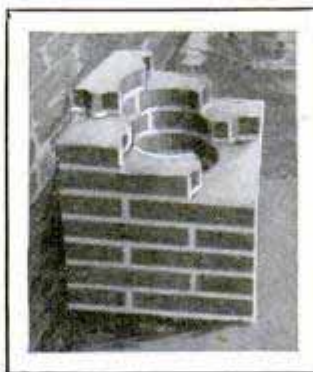
When the department of agriculture sent out its first radio talk to farmers, little more than a year ago, there was some doubt as to the response that would follow. Today, more than 100 broadcasting stations feature the daily farm reports and words of advice, 500,000 students are enrolled for daily lessons in the twenty-four courses the department has prepared, and more than 1,000 letters are received daily asking for further information on various farming problems. Within a few hours after the first reports of the devastations of the corn borer were received, the radio receivers were telling the farmers through-

extended the application of scientific methods to the 30,000,000 Americans who live in rural districts.

CIRCULAR BRICK FOR CHIMNEYS REDUCES FIRE HAZARD

1630

Faulty chimneys are among the most frequent causes of fires, through the burning of accumulated soot, cracks in the lining or other reasons. A flue which is said to be proof against most of the com-



mon chimney ailments is constructed of interlocking brick, so curved on the inner side that, when in place, they form a round, smooth flue. This promotes a swirling movement of hot gases to help keep

the brick free from soot deposits and mortar is securely held in the interlocking joints, which are broken—an additional safety measure. The outside of the chimney is square.

*Holland Chimney Co.
Holland, Mich.*

N.Y. Times 2/20/23

Modern Art Studios
POPULAR MECHANICS London
60 Esamange Building
AUTOMATIC MOTOR LAMPS DIP
WHEN LIGHT STRIKES THEM 848
 813
 & C.I., England.

Automobile headlights—that tip down when light from an approaching car strikes them have been introduced by an English inventor to end the glare trouble. The secret of their action is chiefly a selenium cell, a light-sensitive unit, the electrical conductivity of which varies according to the amount of light that reaches it. The dipping is accomplished through a simple mechanism operated by an electromagnet connected with the sensitive cell. The lights are steadied against rocking and return to their normal position when the dazzling lamps have passed. They may be adjusted to function at different ranges.



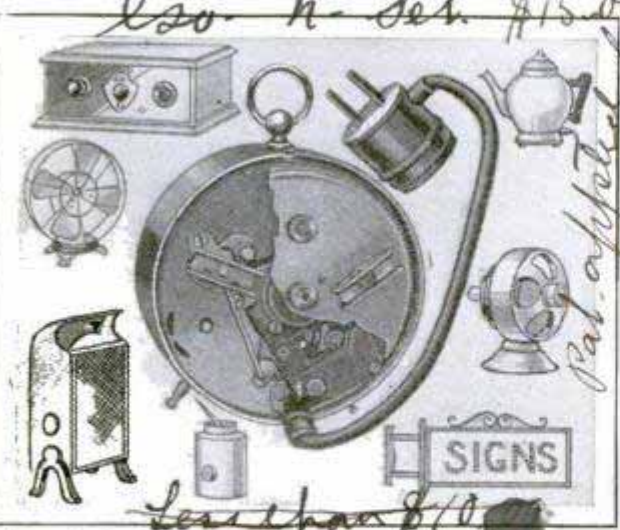
1781
ELECTRIC TIME SWITCH SAVES CURRENT AND GUARDS HOME

The serviceability of a wide range of electrical appliances is greatly increased through the use of a time switch, which automatically turns the current on or off at any desired moment. It is essentially an alarm clock for the electric implement, can be moved from one device to another and plugged in anywhere. Set to light the lamps when persons are away from home, and turn them off, it helps protect the house from intruders, as burglars seldom molest a lighted dwelling. It can be adjusted to control the electric heater, turn the radio set on and off, time the

Lightweight Portable Talking Machine Uses Cone Speaker of Paper Instead of Horn

PHONOGRAPH IN CARRYING CASE HAS PAPER SPEAKER

A portable phonograph which reproduces the record with unusually large volume has been placed on the market in a small case, only two and a half inches thick and weighing eight pounds. The secret of the big volume of sound is the employment of a cardboard cone vibrated by the needle, like a radio cone speaker, instead of the usual amplifying horn. The cone folds up and fits, with six records, into the lid of the instrument when it is folded for carrying.



View of the Timing-Switch Apparatus, and a Few of the Devices with Which It Can Be Used

battery charger, empty feed basins for chickens and perform many other tasks, saving work and electric current.

SIXTEEN MILLION HOMES IN U. S. NOW ELECTRIC LIGHTED 1852

More than 68,000,000 persons in the United States now use electricity in preference to other lighting mediums, according to a recent survey. In the last ten years, the number of installations has tripled, the total number in homes being 16,000,000, exclusive of those having private plants. The rapid increase in building and the growing wealth are factors largely responsible for the spread of electric lights, it is said. In 1926, the eastern and western sections of the country called for more electric installations than any other portions.

*Polly Midwest Distributing Co
 234 S. Wells, Chicago*

Research Laboratory, 1269 Cochran

NY Times 2/20/27

935 *nm*

To Save



Almost a Whole Room in Itself, This Cabinet Holds Practically Everything Required to Prepare a Meal. Including Electric Stove; Folding Board at Side Serves as a Dining Table or for Ironing



Rubber Collar Catches Pitcher Drippings; Below, Roll of Oiled Paper in Box with Cutter for Pinking Edges



Easily Adjusted Clamp Holds the Tablecloth in Place, Preventing Accidents to the China; It Does Not Mar Fabric



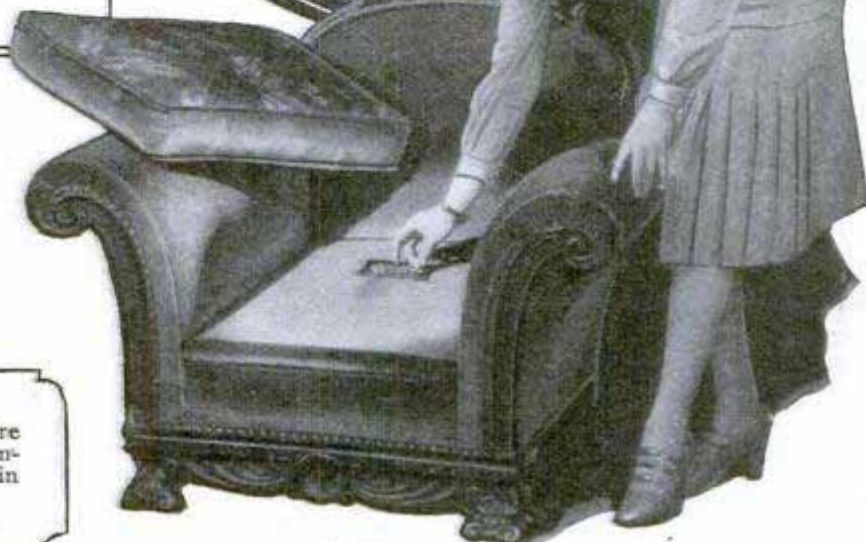
Clothes Rack for the Room; a Hanger That Eliminates Line and Folds Flat against Wall

no Chicago agent.

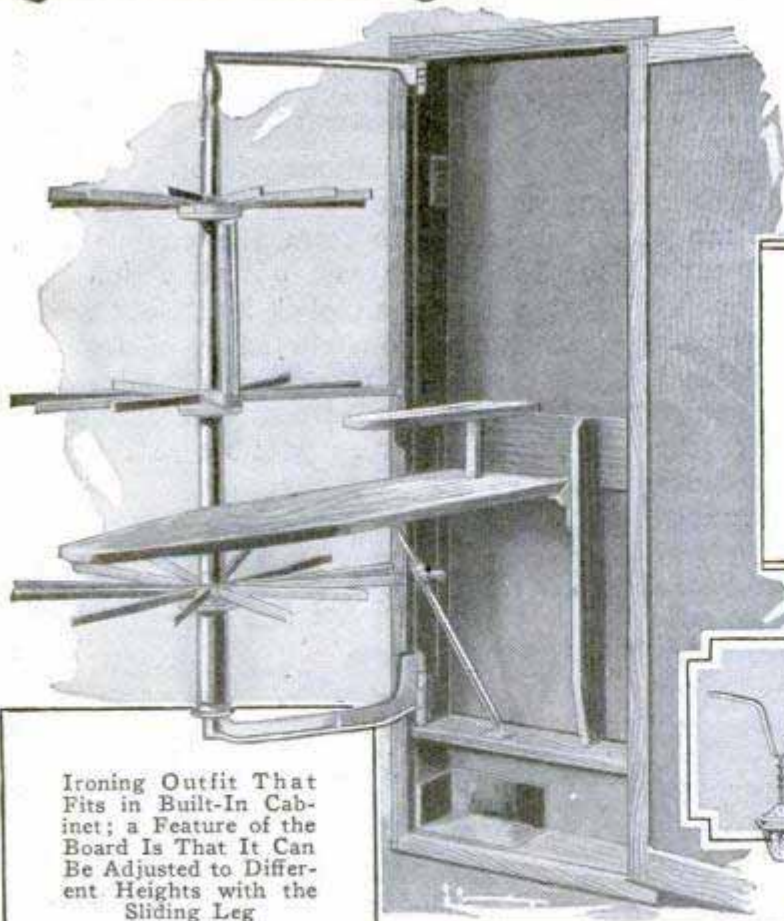
Work in your Home



For the War on Moths, Chair-Seat Pocket Holds Special Chemical and Sitting on Springs Forces Odorless Fumes through Stuffing



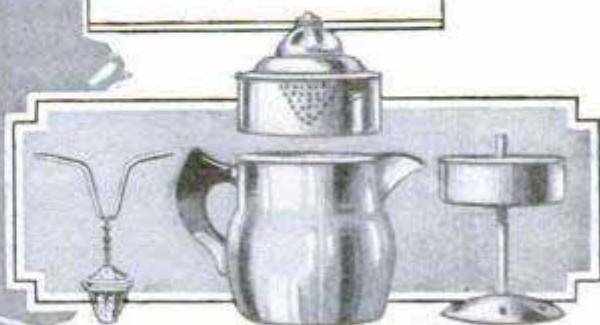
The Wings of This Beater Are Perforated like Those of a Skimmer, and Point of Shaft Fits in Depression in Dish



Ironing Outfit That Fits in Built-In Cabinet; a Feature of the Board Is That It Can Be Adjusted to Different Heights with the Sliding Leg



To Open or Tighten a Wide Variety of Bottle and Jar Tops, This Practical Kitchen Aid Requires No Adjusting Other than Fitting the Top in the Proper Grooves, to Afford Necessary Leverage and Pressure



Pitcher, Teapot and Percolator in One

EIGHT-MILE TUNNEL TO COST OVER TEN MILLIONS



Where Mountains Are Being Pierced for Progress; Course of the Great Northern Railroad Tunnel through the Cascades in Washington; It Is to Be Completed in 1928, According to Present Plans

Another chapter in the romance of railway construction is being enacted high in the towering peaks of the Cascade range in Washington—a gigantic tunnel nearly eight miles long, piercing the backbone of rock and granite under the Stevens pass highway at a cost of more than \$10,000,000. When James J. Hill and other empire builders penetrated the northwest, the high reaches of the Rockies and Cascades were negotiated with bridges and tunnels. But with the increasing westward trend of American growth, the railroads are again compelled to write an epic in railroad engineering, and one is now unfolding over the Great Northern lines where an army of workmen and engineers are boring one of the world's largest tunnels. When completed, at the end of 1928, the gigantic bore will be the longest railroad tunnel in the United States and the fifth longest in the world. A total of more than 1,200,000 tons of rock formation, almost entirely granite, will be removed.

Many novel methods of construction are in use and the tunnel is being built by what engineers term the center-heading method at the east portal, which means that a small tunnel is built first and the main tunnel constructed by enlarging the small one. All rock and material are handled mechanically, and human labor is confined as far as possible to direct machine work.

THREE-PIECE SHOCK ABSORBER IS EASILY ADJUSTED



Consisting of a steel crosspiece, a short spring and a U-bolt, a shock absorber is easily attached and can

be adjusted to varying degrees with little trouble. Its operation is to reduce the motion of the car body by increasing the friction between the leaves of the spring.

U.S. Chain and Forging Co., Union Trust Bldg.

388 Dearborn Chicago

MYSTERY OF BIRD MIGRATION STILL FASCINATING PUZZLE

Why do not birds get lost on their long flights? How do they find their way back to the same spots each year? Why do they start migrating regardless of the weather conditions at that particular time? These, and other questions, still mystify investigators. In the opinion of Dr. Alexander Wetmore of the Smithsonian institution, the meaning of the arrival of the first robin in the spring or the southward flight of geese in autumn, can only be guessed at, for the life of birds is still shrouded in mystery. In general, he believes that migration can be explained by the seasonal climatic changes and resultant movements of certain species. These movements have been repeated so long that the instinct to migrate has become hereditary, a habit so strongly fixed that weather conditions have little to do with it in many cases. For instance, redstarts wintering in the West Indies or wagtails spending the cold season in central Africa, experience no great difference in conditions of climate and temperature between November and April, yet in the latter month they always start north. The majority of small birds fly by night, since they need the daytime to hunt for food. Large birds, such as cranes, ducks and hawks, regularly fly by day. The usual flight altitude of migrating birds is under 3,000 feet, although some have been found as high as 29,000 feet. Smaller species attain speeds of twenty to thirty-seven miles an hour, while ducks and geese commonly travel at a rate of forty to fifty-nine miles an hour.

■ We want all our readers to write us freely and often whenever they wish additional information on articles published in this magazine. Address Bureau of Information, Popular Mechanics Magazine, Chicago. Send no stamps; the service is free.

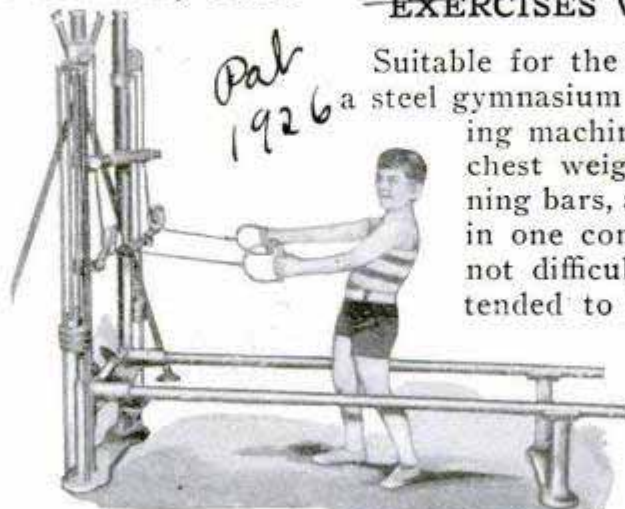


One of the Rustic
Lights on Trail to
Outdoor Theater

WOOD BLOCKS AS LAMP GLOBES LIGHT RUSTIC THEATER

in San Bernardino Mts.
In connection with an outdoor theater in California unique lamps, in keeping with the rustic surroundings of the stage, are used. Electric bulbs have been placed in globes fashioned from blocks of wood with windows cut in the sides. The globes are mounted on posts, made from logs with the bark left on to harmonize with the lamps, along the way that leads to the theater.

150 4.— GYMNASIUM OUTFIT FOR HOME —EXERCISES WHOLE FAMILY

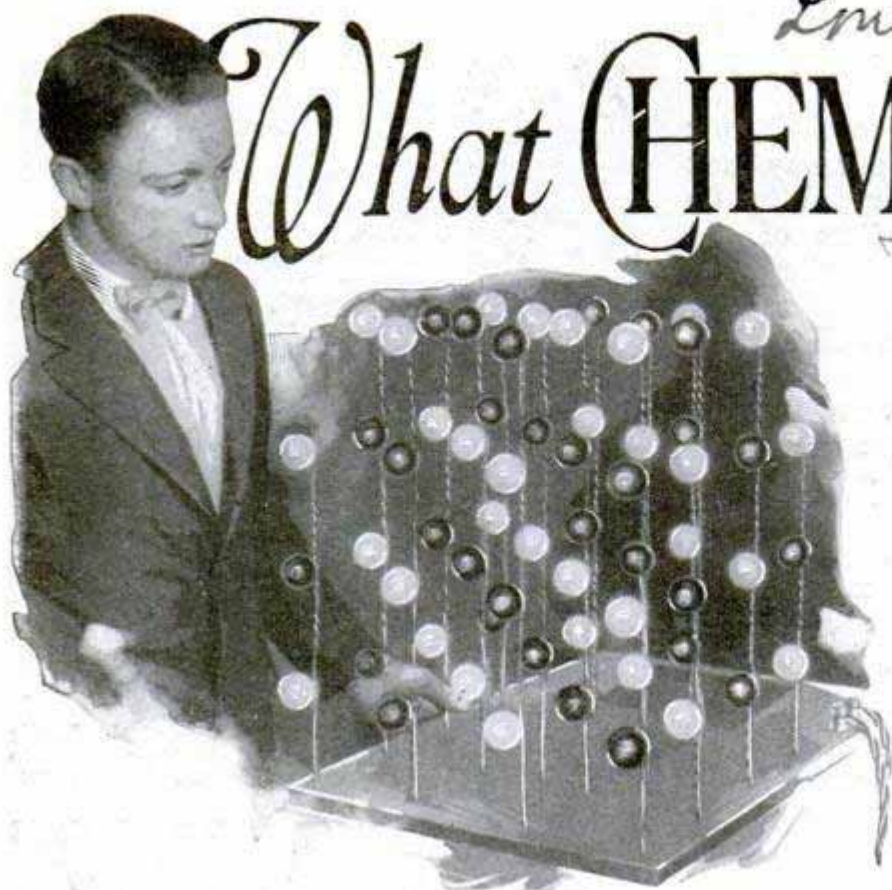


Home Gymnasium Outfit Which Includes Several Different Units and Accommodates Two Persons

Suitable for the home, school or club, a steel gymnasium outfit provides a rowing machine, reducing apparatus, chest weights, parallel and chinning bars, and several other units, in one compact assembly that is not difficult to set up and is intended to last a long time. A special feature is that two persons can use it at once, another advantage being that it is adapted to children as well as to adults without alterations.

*Sym Junior Co,
534 Esplanade Ave*

607
Carr. A. J. Wilkins, Esq.
4, Crowhurst Road, Brixton, S.W. 9
London, Eng.



Mysteries of the Atom Are Reduced to Simple Models Such as This, Showing the Arrangement of a Sodium-Chloride Crystal

ADMIRAL Lord Nelson, less than 150 years ago, formed a society to plant oak trees so that England would always have sufficient sturdy timbers for her battleships.

Today, with his old flagship "Victory," on which he died, still afloat and being refurbished for many more years of life, the battle fleets of the world are built of steel after processes evolved by chemists; driven by fuel oil refined by chemists; fire broadsides propelled by new-fangled explosives with strangely evolved chemical names.

And every day the change that chemists are making in everybody's daily life is no less marked than that they have made in war fleets since the battle of Trafalgar bay.

For hundreds of years, painters, by slow processes, have applied shellac and paint and varnish in successive coats, waiting while each slowly dried. Three years ago, chemists developed a lacquer that combines the properties of all three, dries in a few minutes and that can be applied either by brush or spray gun. But, stranger still, the new material is completely a chemical product. It contains

none of the age-old raw materials of the paint and varnish industries, no gums imported from distant isles, no linseed oil extracted from flax seed, no turpentine from southern pine forests. Instead it is a by-product of the same industry that produces the T. N. T. for the battleships' guns, and which, in turn, has displaced the black powder of Nelson's day. And both the lacquer and the T. N. T. are, in a way, by-products of the cotton-cloth business, since both are made from cotton linters, which are

fibers too short to be used for spinning.

When you have your automobile re-finished in quick-drying lacquer, you are really having it covered with cotton, dyed to the desired shade, for the chemicals used to dissolve the cotton dry when the lacquer is applied and leave behind what is really a cotton cover.

The same chemical genius who is finding an outlet for millions of pounds of cotton in these test-tube-created industries, is only repairing the damage it had already done to the cotton grower by inventing artificial silk that can be sold so cheaply it threatens to run both the silkworm and the cotton plant out of business. Last year, 50,000,000 pounds of "rayon," which is the chemical name for artificial silk, were manufactured in this country, and millions of pounds more abroad. Rayon is nothing but wood pulp, dissolved by chemical processes, squirted through tiny holes, to emerge as a thin thread, which passes through a fixing bath and comes out of it as artificial silk thread, ready for spinning.

There is nothing new about these chemical processes as substitutes for natural

is DOING *for* YOU



The Alchemist, from an Old Print of 1690; Interested Chiefly in Turning Base Metals into Gold, the Alchemists Missed the Opportunities by Which Modern Chemists Win Gold from Strange Materials

materials, except that chemistry has taken such a spurt that it develops them by dozens yearly, instead of one or two every hundred years or so. Some chemical substitutes have been in use so long that we have forgotten that they are that. Take window glass, which displaced a natural product—hides, scraped thin; or paper, which took the place of a whole list of natural products, including hides, plant leaves, and, still earlier, stone slabs as a writing material. Both the glass and the paper are just as much chemical substitutes as celluloid is an artificial substitute for ivory; a coal-tar dye for a vegetable color; or the dentist's non-habit-forming novocaine is a substitute for the dangerous opium from the poppy plant.

In the field of foods, the chemist is making equally important strides. Artificial butter and chemical substitutes for lard are made from any fatty oil that can be hardened by treatment with hydrogen, including such waste products as cottonseed oil and peanut oil, while artificial

sweetening to displace sugar is extracted from corn, and a real sugar from beets.

One doesn't think of milk and meat as being by-products of the tannery trade, but if it wasn't for artificial leather, every head of cattle in the country would have to be sacrificed to meet the demand of the automobile industry alone for tops and seats, and then porterhouse steak would be but a by-product left over from making leather. As it is, so much artificial leather is being made by chemists that it is ousting the real thing for almost every purpose except shoes and such luxury articles as fine luggage and handbags.

These chemical substitutes are revolutionizing life, not only for those who profit by their use, but for those who made a living from the things being displaced. Before chemists perfected coal-tar dyes, a million acres in India were planted to indigo, which furnished just one dye color. Recently a nine-million-dollar American industry devoted to the extraction of methanol and acetone from wood has been



Dr. H. C. Gore, Government Chemist, with Apparatus by Which He Produces Sugar from Corn through Imitating Processes of the Human Stomach

faced by these same chemicals made more cheaply by synthetic processes. The Japanese camphor monopoly has had to cut prices to meet synthetic camphor competition from France and Germany, and the Chilean nitrate producers are seeking a lower export tax to enable them to compete with nitrates that are now extracted from the air.

When an industry is wiped out by a synthetic substitute there is a loss, and a new use for the land or equipment must be found. But there is another side to the picture, too, for synthetic substitutes are making it more difficult for producers in one part of the world to form a monopoly and extract exorbitant prices from users elsewhere. In fact, recent experience has shown that every monopoly in a natural product is inviting the chemists to find a substitute. The Japanese camphor growers apparently had the American celluloid industry in the corner when it boosted prices, but chemists came right back with

synthetic camphor. The high prices exacted by British rubber growers from American tire makers have given a spurt to the search for synthetic rubber, and it has already been produced in the laboratory by several processes, though none as yet lends itself to commercial production in competition with rubber at present prices. Given time and the incentive of an active demand, and the chemists boast that they can produce a synthetic substitute for any raw material.

There is another side to chemistry that has had an equally rapid development in recent years—the chemical detective who trails down the criminals of the producing vats and makes them behave. Take the case of a maker of beauty clay who carefully baked his raw material to kill every

last germ and mold spore in it, then re-dissolved the clay in sterilized surroundings, bottled it in fancy jars—and then had dozens come back covered with mold. The chemical detective was called in and found that the mold spores were coming in through the cracks of the factory doors, which couldn't be sealed. So he worked out a formula for adding a harmless anti-septic to the clay, and thereby eliminated the necessity for baking, with the result that the product was improved, since the baking used before destroyed some of its natural properties.

The same detective was called in consultation by a shipper of oranges who had developed a bright pink wrapper for his fruit, recognizing the value of color in selling foods. Only the wrappers, made of special paper in the dealer's own paper mill, came out a dirty pink, so he wanted a new dye. But the detective went to the source by analyzing the paper and discovered it contained tiny fibers that had

507



With This Queer Helmet and Set of Flasks, Scientists at the Carnegie Institution Measure the Amount of Oxygen a Man Breathes In and Discover What He Does with It to Sustain Life

not been properly bleached. These were dark-orange instead of white, and the dye made them a darker orange. No dye could have remedied the trouble, but when the paper formula was changed, the trouble ceased.

In another case he was invited to catch the bug that would eat holes in a galvanized-iron roof. The holes were confined to one section of the factory roof, and when the trouble was finally traced down, it turned out to be a water-cooling apparatus on the roof of another factory, nearly a half mile away. The holes showed traces of alkaline matter, and an alkaline water softener was used at the distant plant. When the wind was in the right direction particles of alkaline spray were carried over and deposited on the iron roof. After the cooling plant had been corrected, there was no more trouble.

The chemical detectives are frequently called on in court cases. In one case that went to trial, the owner of a grove of avocado trees, producing fine alligator pears, charged the city had ruined his trees when a water-pipe trench was dug across the corner of his land. Dust from the digging, he claimed, settled on the tree leaves and closed up their breathing organism when rain turned it into a fine mud film, thereby asphyxiating the trees. The city denied the claim, but the chemi-

cal detective proved to the court's satisfaction that his analysis of the mud film showed the dust could have come but from the one place where the trench was dug.

The mystery of why a telephone lineman's fine leather life belt should suddenly crack through was finally solved by another test-tube sleuth. The repairer discovered the break just before climbing a pole, and thereby saved his life, but the telephone company wanted to know the why and wherefore of the belt's failure, in order to guard against accidents in the future. After examining the belt under a microscope, the detective questioned the lineman and reconstructed the story of what had happened. He had been caught in the rain, went to his girl's home for a cup of coffee and to dry out, and while there, leaned up against a radiator, burning the wet leather so badly it cracked when it dried.

1682.

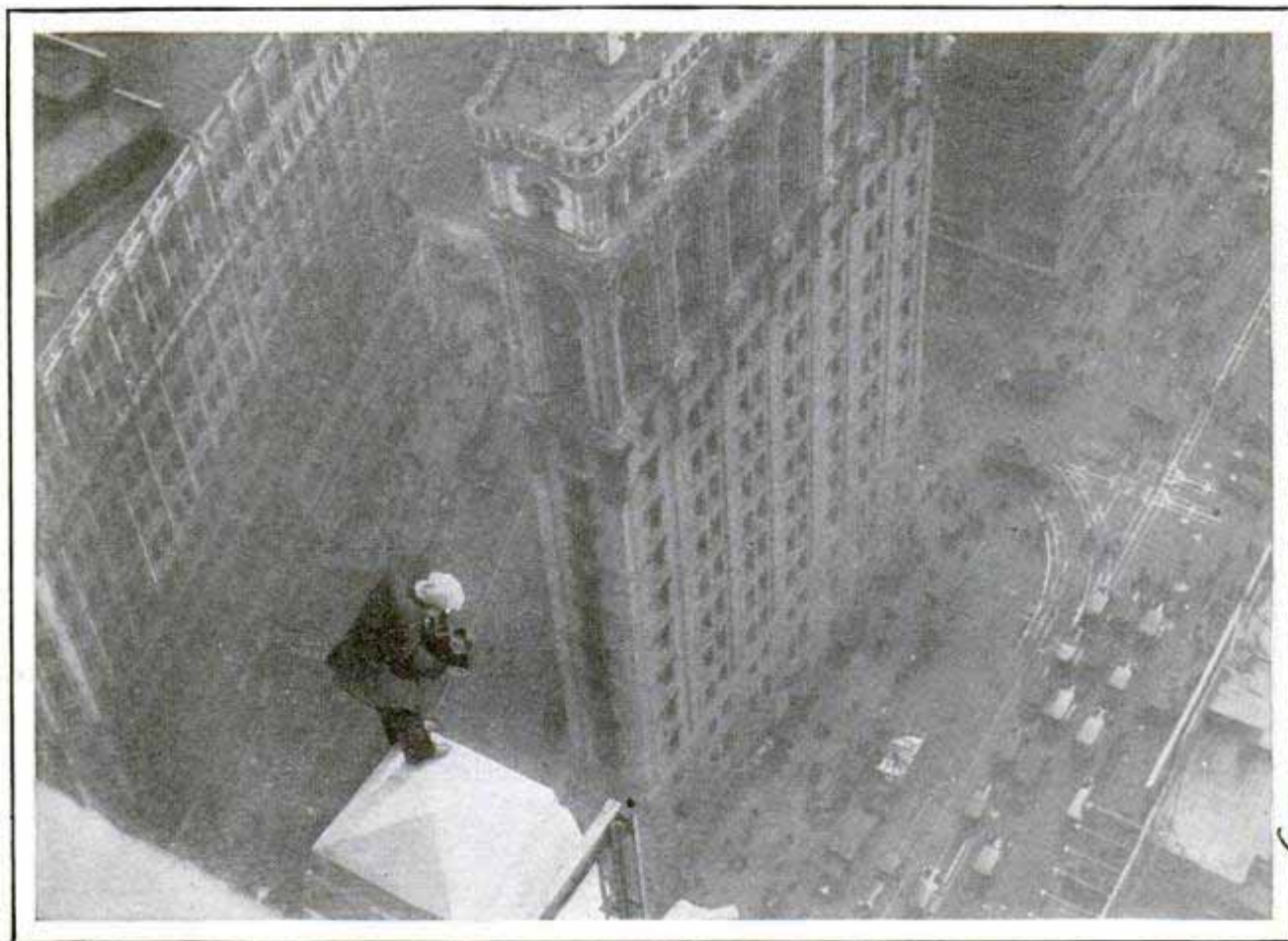
PAPER MILK BOTTLES

As a substitute for glass bottles, a London dairy is using containers made of a stout, transparent paper. When they are filled, they are brought together in the form of a cone and sealed with a metal clip. The breakage and loss of glass are saved by this plan, and the paper bottles are easily manufactured and sterilized.

Used by Blue Ribbon Milk Corp. London, Eng.

Seabright Co. Fulton, N.Y.
Standard Package Co., 5 Chestnut, Boston, Mass.

CAMERAMAN RISKS LIFE IN GETTING PICTURES



Wider Vistas of New York Appear as Towering Skyscrapers Rise, and to Record the March of Progress, Photographers Climb to Perilous Heights to Obtain Their Photographs

Fearlessness is not only helpful to the news photographer but is frequently a necessity since his calling often takes him into perilous situations. Standing upon an abutment of the new Paramount theater building in New York city, a cameraman snapped a view while a companion above him took the accompanying picture, showing the man on the edge calmly adjusting his camera, apparently undisturbed by the abyss below.

attached to an iron post to ground it, and a small crystal set connected to the improvised aerial. Several North American stations, according to the British Electrical Review, were tuned in.

LOCK FOR DOOR KEY PROTECTS HOME AGAINST BURGLARS



Old-fashioned locks are secured against tampering by means of a small brass unit which is slipped into the keyhole after the door has been locked with the usual key. It prevents pushing the key out and guards it against loss. The piece is

quickly removed or inserted and is intended to last a life time.

CRYSTAL SET IN IRELAND GETS U. S. RADIO

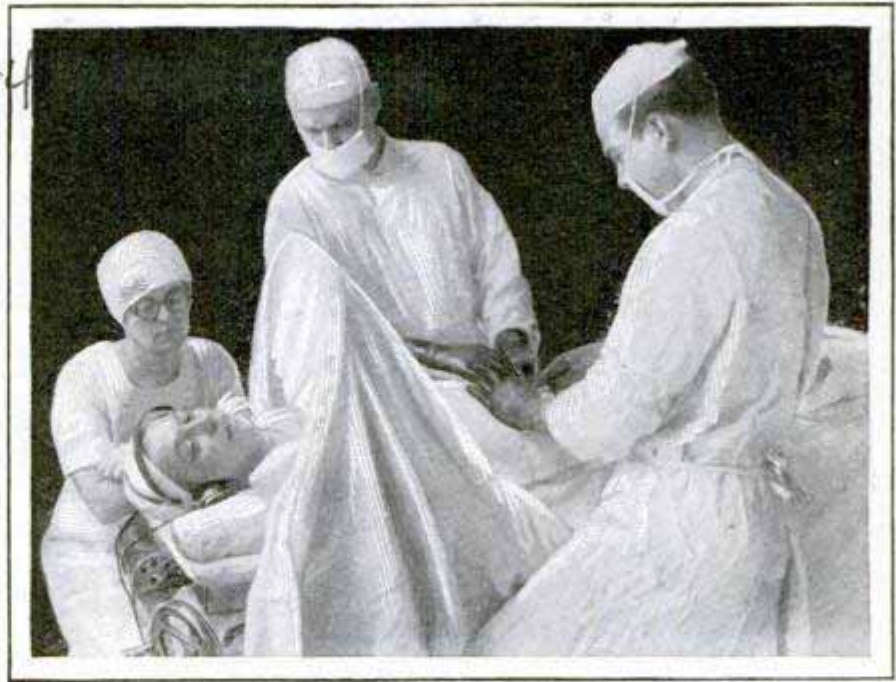
American broadcast stations were heard loudly and clearly in Ireland on a crystal set, according to Dr. Ellison, of the Armagh observatory, in Ulster. Dr. Ellison was flying a six-foot box kite at a height of 2,500 feet, making experiments with atmospheric electricity, when the steel piano wire used as a kite cord began emitting strong sparks as a result of becoming charged from the clouds. The wire was

Set made by Bramie
1111 1st St.

The Relox Co, 450 3
Chicago

THICK BLANKETS NOT ALL WARM TESTS SHOW

Just because a blanket is thick, it is not necessarily warm, especially if it be a closely woven one, tests at the bureau of standards disclose. The air spaces between the fibers are important since they are non-conductors of heat and cold. If the meshes are so thick that the spaces are few, the blanket will actually carry the heat away from the body. So far as resisting the passage of heat is concerned, cotton is found to be almost as effective as wool, but it absorbs moisture, whereas wool repels it, and hence is less fit, especially for outdoor use.



Patient Listening to Phonograph Music through Headphones to Ease Mind While Surgeons Perform Operation

MUSIC EASES THE MIND SHOCK OF SURGEON'S KNIFE

Music has been employed successfully in an eastern hospital while operating on persons under a local anæsthetic. Special headphones are worn by the patient, music being relayed from a phonograph in a distant room, so that it cannot disturb the surgeon or other attendants. It has been found that the tunes ease the patient's mind, divert his attention from the operation and thus make it easier for the doctors. Although the local anæsthetic eliminates pain, in many cases difficulty is experienced while operating on persons under such conditions because they remain conscious and nervous.

FADELESS FLOWERS OF RUBBER RIVAL NATURAL BLOSSOMS

Realistic reproductions of several different kinds of flowers are now being made from rubber by a patented process. They are colored in natural tints, a bit of perfume may be added to heighten the effect of genuine blossoms and an additional feature is that the leaves and petals cannot be crushed or bent, one of the objections to cloth flowers. The rubber flowers may be quickly washed with soap and water and are so arranged that they may be opened or closed to represent fully blown blossoms or buds.

FIFTEEN-INCH SHIP HAWSERS WEIGH OVER FOUR TONS

Fifteen inches in circumference and weighing 9,000 pounds each, two huge ship's hawsers have been delivered to a Boston firm. They are said to be the largest in the world. The ordinary hawser is from five to ten inches around and



Copyright, Herbert Photos

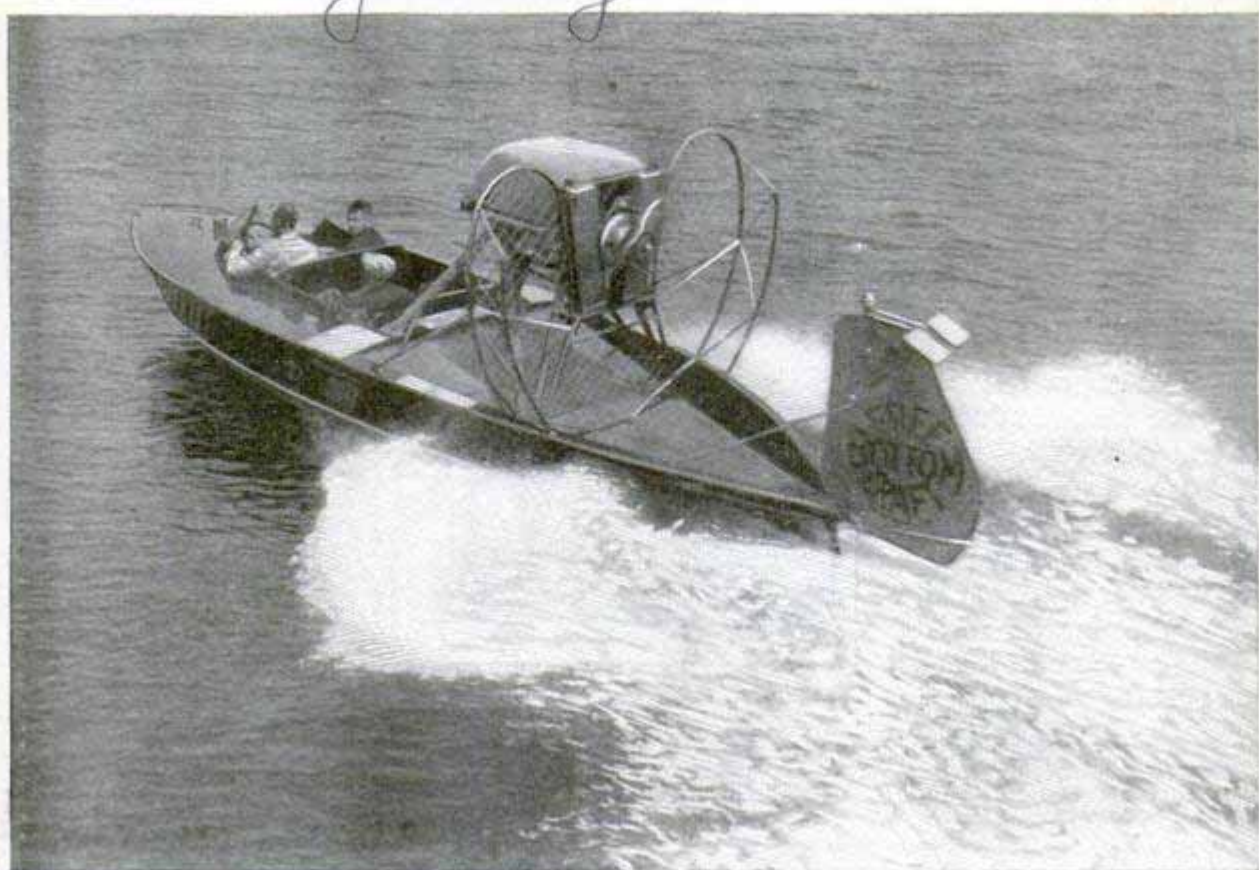
To Keep Big Ships from Wandering; Huge Hawser That Weighs Four and One-Half Tons

weighs from 900 to 3,600 pounds. Each of the big ropes is 1,200 feet long.

on Central wharf
Boston Mass

P. O. B. Cow & Co. Ltd.
46-47 Cheapside,
London E.C.2, Eng.

Desiree
1692
Mrs. McCarrie
Imvini



Under Way with the Rudder Out of the Water for Steering Somewhat like an Airplane; the Free-Bottom Craft Skimming on Shallow Water without Danger of Fouling Propeller

RUDDER IN AIR GUIDES BOAT AT TOP SPEED

Driven by an air propeller and steered by a small rudder which is automatically lifted as speed increases, so that guiding is done with the rudder entirely in the air when at top rate, a motorboat now on the market is fitted for travel over deep or shallow water. It can run at full speed in three or four-inch depths, according to reports, and as all the running gear is clear of the bottom, there is no danger of fouling any part in weeds or other obstructions. An eight-cylinder motor affords abundant power, and speeds of thirty miles an hour are easily attained.

SHARKS ARE COWARDS

1721 A swift blow of the closed fist back of a shark's dorsal fin will cause it to flee, according to pearl divers. They say that the big fish usually are frightened when encountering a man for the first time. The eyes are vulnerable parts and encounters have been won by gouging them. To bat-

tle a shark, a man must be an expert swimmer, the divers assert, and the fight is not without great hazards even if the fish gives up against an attack with the bare hands. Several divers have been severely lacerated by the rough sides of the shark, although they escaped its teeth and put it to flight.

MAGIC GARDEN FROM CHEMICALS "GROWN" IN GLASS BOWL

1636 Odd formations resembling plant growths are quickly produced by chemicals in a glass bowl, the result being an interesting and decorative "garden" for study and amusement. The outfit includes a shell molded from paraffin, fine sand, colored crystals and a can of chemical, which starts



its action almost immediately and causes daily changes in the growths.

Kansas City Star
2/16/27

Marvel Products Co.
427 Third St.
Grand Ave.

Marvel Products Co.
427 Third St.
Grand Ave.

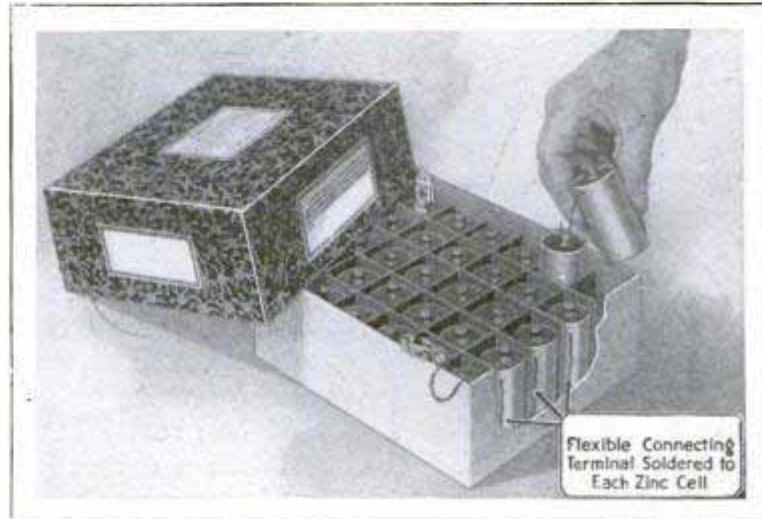
A and B-Power Combined in Single Unit

A combined A and B-power unit recently placed on the market has a number of novel features, not the least of which is that it makes no attempt to rectify and smooth out the lighting current for direct use as A-power supply, but instead incorporates the usual storage battery with a trickle charger. The charging unit is adjustable for three different charging rates, of .2, .4 and .8 amp., respectively, per hour. At that rate, a nine-tube super-heterodyne that uses 201-A tubes, or an eight-tube set employing seven 201-A tubes and one power tube, can be operated 5.86 hours a day and yet kept fully charged by using the .8-amp. connection. A table is furnished showing the number of hours a set of any number of tubes, from one to nine, can be operated on each of the three charging rates without depleting the battery. So, all the owner need do is to plug the charging connection in the proper terminal for his average operating time. Another novel feature is a single switch which operates both A and B-power and the charger, eliminating the use of the switch on the radio set, which is turned on and left in that position. The power-unit switch is of the toggle type, and when the lever is up, the B-eliminator is turned on and the A-battery connected to the set, while, by throwing the lever down, the eliminator and battery are disconnected from the set, and the battery is connected to the trickle charger. The battery is of the glass-cell type with indicator balls, eliminating the need of a hydrometer, and both battery and the jar of the liquid rectifier of the charger have high and low-level lines to tell when the solution needs additional water. The

charger liquid is covered with an oil seal to reduce evaporation. The entire unit is inclosed in a neat metal case, 11½ by 13½ in., and 8½ in. high.

Loose-Cell, Renewable B-Battery

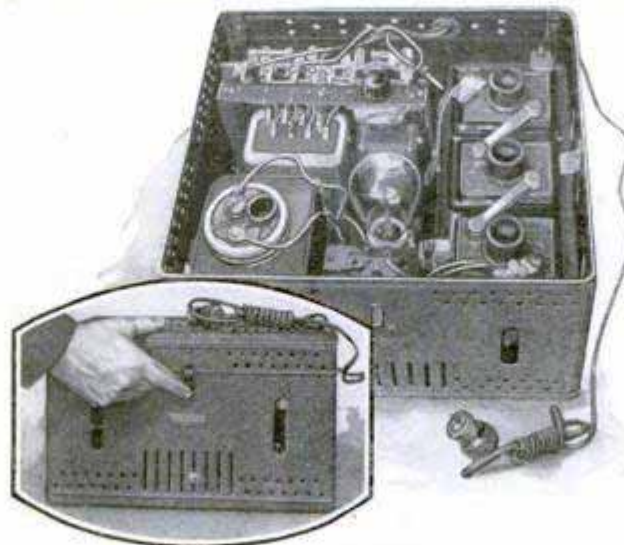
A renewable B-battery, containing 30 loose cells and delivering 45 volts is now



B-Battery Unit, Showing Arrangement of Cells, and Positive and Negative Terminal Clips

available. For the radio experimenter and set owner, this type of B-battery has several advantages over the sealed-in type. Each cell furnishes 1½ volts and the total of 30 cells wired in series is the usual 45 volts in common use. The main point, of course, is the renewable feature. Any first-class B-battery will give excellent results as long as each of the 30 cells functions evenly, but often one or more cells become weaker, setting up a high resistance, injurious to the good ones. In the

loose-cell form, the user can discard the weak cells and not appreciably hurt the battery, or he can add cells and bring the battery up to strength, taking advantage of the full life of all cells.



Above, Lid Removed, Showing Compact Arrangement of Parts; Insert, Unit Ready for Use

Popular Mechanics' New Perfect-Tone Six appeared in the March, 1927, issue; blueprints are 15 cents.

Philadelphia Storage Battery Co.,
Ontario and C. Sts.

1044 Q.
Musselman, C. W.
549 W. Washington, Chicago.
Q. J.

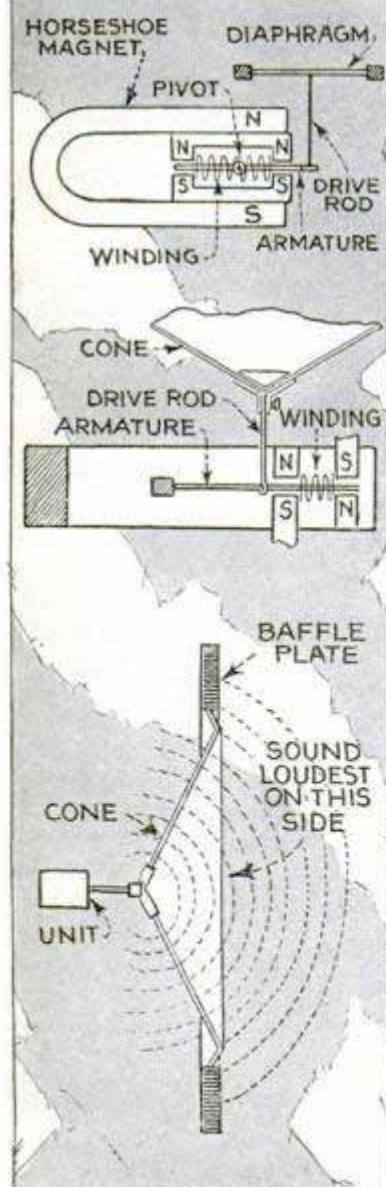


L OUD speakers are no longer what they used to be—merely noise makers that grate on the ears of the listener. The past year has brought forth a number of loud speakers that not only speak loud, but distinctly, and really reproduce the original quality of voice or music. The best radio set in existence would be greatly handicapped with a poor speaker, and it has taken a determined effort on the part of the speaker manufacturers to remedy the defect.

The sensation of sound received by the ear is produced by the vibration of the air or other medium with which the ear is in contact. Sound has three characteristics—quality, pitch and volume. It must have quality to be pleasing to the ear, pitch to differentiate the higher and lower tones, and volume to truly reproduce the bass notes. In fact, the value of radio in the home depends upon getting all of these factors, which the set is capable of delivering, to the speaker. An improperly designed set cannot produce the desired result, but as circuit design has improved rapidly, there are very few sets of modern type that will not give good results with one of the new speakers.

The loud-speaker unit grew out of the ordinary telephone receiver, and for a long time nothing much was added to it except horns of metal or composition. With more research the efficiency of the unit was increased, air-gap adjustment was added, and the proper shape and size of the horn were gradually worked out. The demand for more volume resulted in many other changes to adapt the unit to power amplifiers.

The balanced type, shown at the upper left on this page, was developed for this purpose, the feature being the light, floating armature, which is used in many speakers now on the market. The armature is pivoted midway between the poles of the permanent magnet. This unit is more sensitive than the plain type, has wider air gaps, making an adjustment unnecessary, and eliminates the possibility of blasting on excessive volume. The semi-balanced unit, shown below, is similar except that one end of the armature is fixed, the other end being free to vibrate. By virtue of these changes in design, not only was greater volume obtained from powerful permanent magnets, but quality was im-



Should Know Loud Speakers

BY F.L. BRITTIN

proved by overcoming the pull of the magnets on the diaphragm, always present in the old two-pole types. This is illustrated in the lower diagram on page 828, in which the upper sketch shows the old type, with its iron diaphragm, and the dotted line under the diaphragm the ever-present pull which the incoming signal must first overcome before the diaphragm can begin to vibrate in response. By the use of four-pole units and mica, aluminum or composition diaphragms, the armature is held in a neutral, or balanced, position, eliminating the pull.

Now that we have some idea of the unit, let us consider the various methods of employing it to best advantage. It is important that the horn be made to carry the output of the unit faithfully. The variety of shapes, sizes and methods of application now in use shows a wide divergence, but each has good points that undoubtedly will be combined in the ideal speaker of the future. The horn, or cone, must render the sounds truly and without addition or subtraction of its own. Speaker defects become apparent when the listener uses headphones. The music will come in clear and almost perfect, but when the horn is plugged in, something often happens to the signal—the quality is not as good. This distorted signal comes from the horn and not from the set; the former may be efficient, but the fault lies with the design or material used in the speaker itself, or in the manner in which the energy from the unit is applied.

Without entering into a discussion as to the relative merits of the horn or cone-type speaker, it is an accepted fact that neither is perfect as yet, and the personal opinion gained by listening to various types on the same set and program is the best guide in making a purchase. Some manufacturers combine a cone and horn speaker in the same set; many experimenters have found that placing two or more speakers in series or in parallel improves tone quality, a high-pitched horn and one with a low pitch being employed with good results, or a small high-pitched horn combined with a cone speaker of low pitch.

Cone speakers seem to have a special affinity for the low notes. While this, in a measure, is a good point, it cannot be overdone, for the ultimate idea is to produce a cone or horn, or combination of both, that will cover as far as pos-

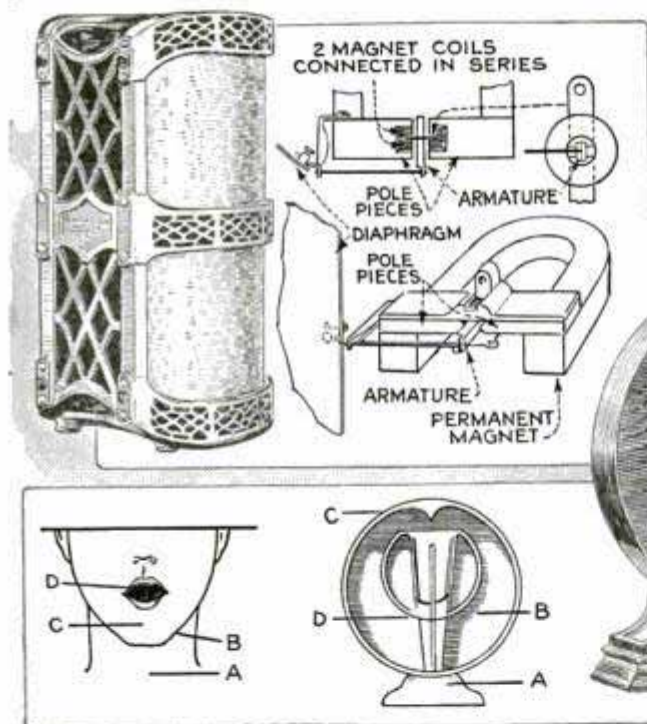


sible the range of the human ear. Several manufacturers have tried, for this purpose, to reproduce the proportions and shape of the human throat. A speaker of this type appears on this page. The diagrams at left illustrate the points brought out by the designer. A represents the sound-producing unit, or "vocal cords," the sound being amplified through orifice B, the "larynx," until it reaches the conducting area C, comparable with the back of the throat. From this point, the sound is again conducted to the mouth. Cone speakers are of many varieties and lately have come in for extensive laboratory experimenting. Many amateurs build their own cones and some use the ordinary head-phone, or one of the large units designed for adapting a phonograph speaker for radio use. Lately, several types of large cones, some 3 ft. in diameter, have appeared on the market in knocked-down

the principle involved is shown at lower left on page 826; the dotted lines at front, compared with those of the rear, show the loudest sound at the concave side, or front, of the cone. Cones are made up in many attractive types, some of which are shown. European types are often fitted with pleated-paper diaphragms; some of the American types are made up as cylinders and others, in the form of open books or wall-clock designs, are especially adapted to room furnishings. Some of the newer types mounted on pedestals are very attractive and can be easily moved from point to point in the room to obtain the best results.

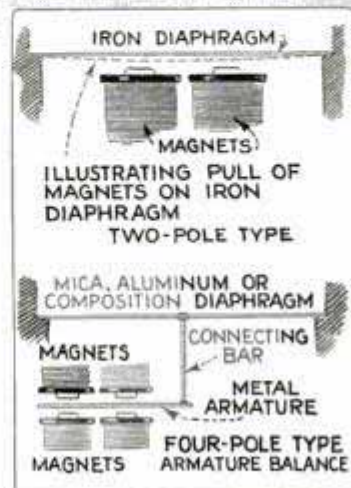
Within the past year several manufacturers have developed speakers where the actuating unit is applied in a different manner from that heretofore used. For example, the cone speaker shown on page 827 differs in that its diaphragm has been mounted eccentrically, or off center, the idea being to obtain vibrating areas of different length. Using the harp or piano to illustrate the point, long strings are used to give out the low notes, while high notes are produced by the short strings. The oblong speaker on this page

consists of a cylindrical vibrating surface, projecting the sound waves in all directions, and is said to give equal re-



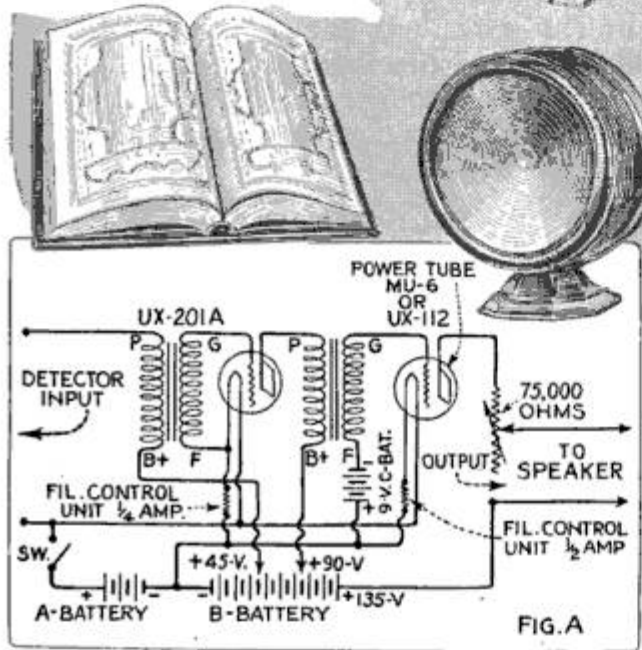
form, complete with a large unit and ready for assembly.

The experimenter will notice that, when the cone is mounted in a cabinet, the volume is increased. The cabinet not only reflects the sound waves from the convex side of the cone, but also acts as a sound chamber. One manufacturer makes use of this fact in the type shown at the bottom of page 827. A wood baffle plate is placed around the cone; this wooden ring is 3 to 4 in. wide. A diagram illustrating

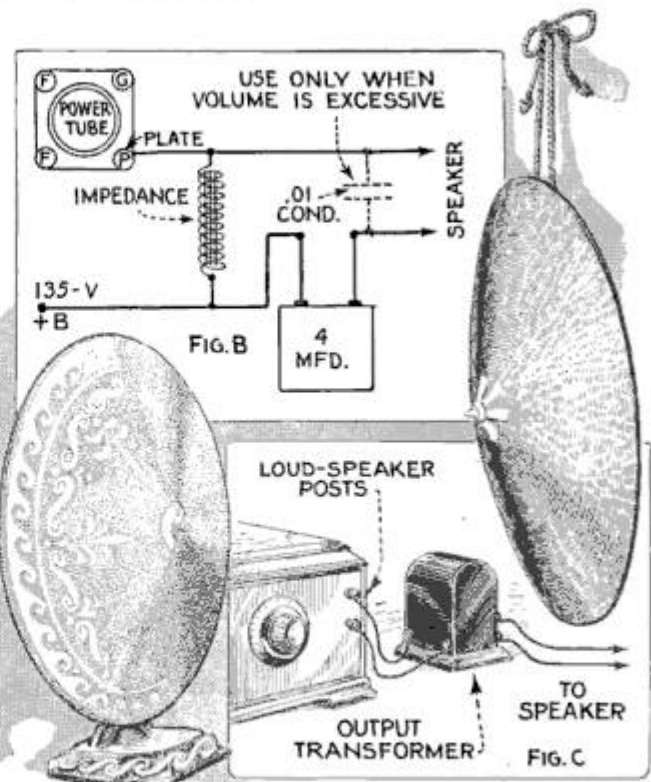


production of all frequencies within its range. The diagram shows the method of applying the actuating unit, in a lateral manner, to the edge of the diaphragm.

Let us now consider just what the set and speaker should do, and whether or not they do it. First, as to the character of musical tones, each note has a frequency or vibration of its own, known as the fundamental, and several "harmonics,"



or other vibrations, that give it timbre or color. To get this true color, the speaker must respond to the higher vibrations as well as the fundamental frequency. These harmonics or tone-color frequencies permit us to distinguish a note on the violin from the same note on a piano, and the overtones must be reproduced by the speaker, or the music will be of poor quality. The human ear covers a very wide range, as may be seen in the diagram on page 830. This range will, of course, differ with the individual, but it is readily seen that even the better commercial radio speakers cannot satisfy it fully at the present time. It will also be noted that radio speakers cover the higher notes better than the lower end of the scale. The overtones of these low notes are often heard in some of the new speakers, but there is still plenty of room for improvement, even though some of them cover



sounds from 80 vibrations up to 5,000. The speaker is not always to blame for poor results, for a really well-designed speaker will often sound worse on the average set than a poor one on the same set. The reason for this rather startling fact lies, sometimes, in overloading the set, or in some fault in the broadcasting station itself. Unnecessary tones produced in this manner are of a higher frequency than the poor speaker can reproduce, but are well within the range of the good speaker.

Two important things to listen for in a loud speaker are the low tones of musical instruments and the distinctness of spoken words. As far as the broadcasting stations are concerned, they are working out ways of bettering their equipment and have made great strides. The set owner and builder can easily prevent overloading in his set by a number of very efficient methods. So-called power tubes are designed for this purpose, making possible the full volume of the set without overloading. They are used in the last stage, and usually require about 135 volts of B-battery for their operation, also a C-battery to offset the higher drain on the B-battery. The method of applying the necessary B and C voltages is shown in Fig. A, on this page. Even with this power tube added, it is advisable to regulate the plate output of the last tube with some form of variable resistance. This should be done

regardless of the kind of audio amplifier used in the receiver, whether it be transformer, resistance or impedance-coupled, and with any type of loud speaker. This is very simple, as any type of variable resistance of approximately 75,000 ohms can be used, as shown in Fig. A. The method will prevent distortion due to overloading the speaker by helping to match the impedance of the speaker with the output impedance of the set. A small horn-plug, with a variable resistance built into it, is now available and greatly simplifies the arrangement.

Another method is shown in Fig. B; this is in the form of a filter, or choke, to eliminate the direct application of high d. c. voltages to the loud speaker. At the same time it keeps all direct current out of the

coils in the speaker unit. The impedance unit used is a General Radio, type 369, but a Samson or similar type can also be used. The sketch below shows a very simple and efficient remedy for preventing overloading of the speaker, which is known as the output transformer. This unit is available in several good makes and can be used either inside or outside the set. While output transformers have been known to the engineer for many years, and have been extensively used in England and on the continent, their general application in American reproducing systems is rather recent. In this case, as in the impedance or choke method, the idea is to keep the d. c. out of the speaker unit. If a loud speaker is connected directly in the plate circuit of a vacuum tube, and a station is

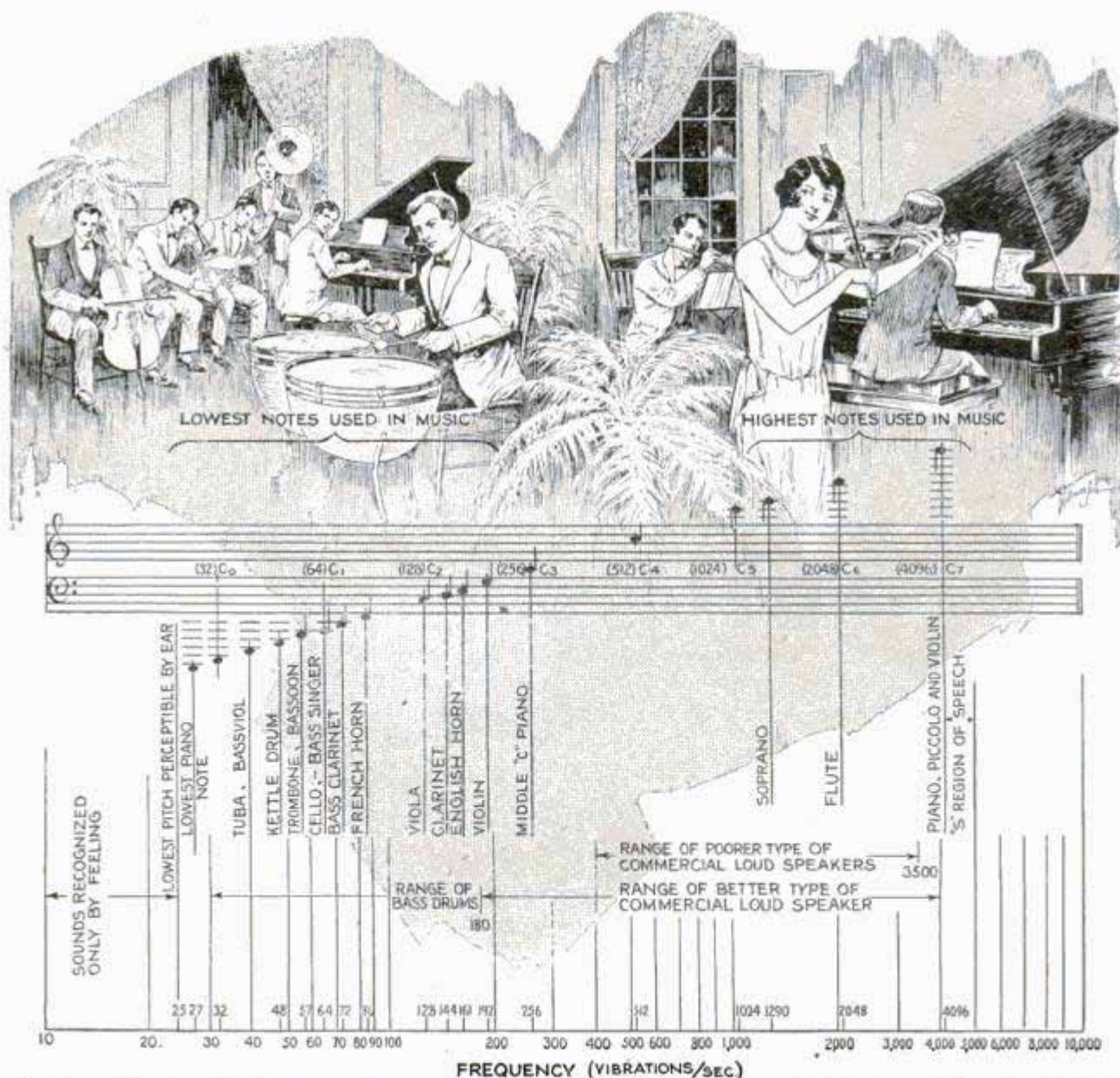


Diagram Showing the Frequency Ranges of Various Musical Instruments and the Human Voice, as Well as the Comparative Ranges of Radio Loud Speakers Now in General Use

tuned in, there will be two forms of current passing through the speaker unit. The first is a steady, direct plate current from the tube, and the second is an a. c. representing the signal energy. This is an objectionable condition, for the steady plate current performs no desirable function in connection with the reproducing unit; the main idea is to feed the loud-speaker energy only when a signal is being received. The power-handling capacity of the average speaker is limited; therefore, if the high voltage d. c. is shunted off, the speaker unit has a much better chance of doing something worth while with the signal. In the impedance arrangement, Fig. B, the d. c. plate current goes through the choke, or impedance, coil, and cannot get through the large fixed condenser to the unit. In the output transformer, Fig. C, the transformer consists of a primary and a secondary winding, the former being designed to provide approximately the impedance required to match the output impedance of the power tube. The secondary may be designed for any desired value of impedance suitable for the modern loud speaker, an arrangement whereby both the power tube and the speaker unit are matched and hence will produce the best results.

A and B-Battery Eliminator

A new power unit supplying both A and B-current for the largest radio receivers, has lately made its appearance on the market.

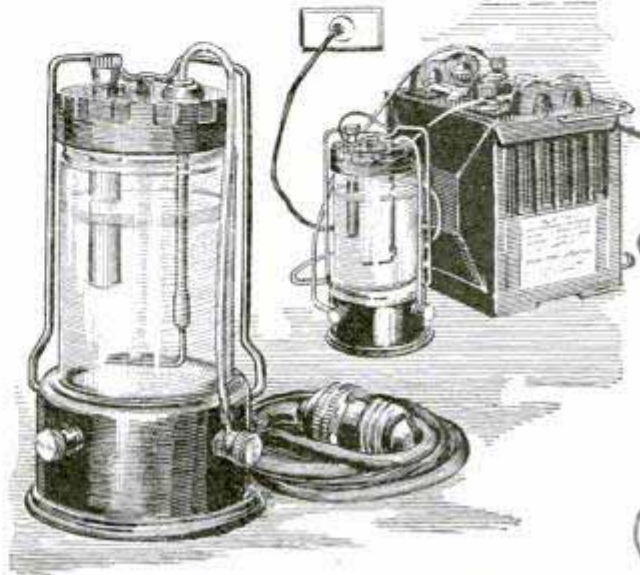
Operating on 50 to 60-cycle, 110 to 120-volt a. c. supply, this unit eliminates both the A and B-batteries. Ample current for the largest 10-tube receiver, as well as for smaller sets, is supplied with full voltage when under load. It is claimed to be absolutely noiseless in operation, with no perceptible hum. This compact unit supplies up to $2\frac{1}{2}$ amp. A-voltage at 6 volts and up to 70 milliamp. B or plate current of 125-volts under load. The power con-



sumption is about 40 to 50 watts on the average 5-tube receiver and from 50 to 60 watts on a 10-tube superheterodyne.

Small Trickle Charger Is Noiseless

A small noiseless trickle charger that costs only about a tenth of a cent an hour to operate is now available. It keeps the



Small Trickle Charger, Showing Proper Solution Level; Right, Connected to Battery and Wall Socket

A-battery fully charged, and permits the use of a small A-battery where space is limited. No attention is required once the connections are properly made and the current turned on, except the occasional addition of pure water, and there are no bulbs or moving parts to wear out. It is designed to be used with a. c. current, 110-120 volts, for 60-cycle supply.

Tests for Loose Connections

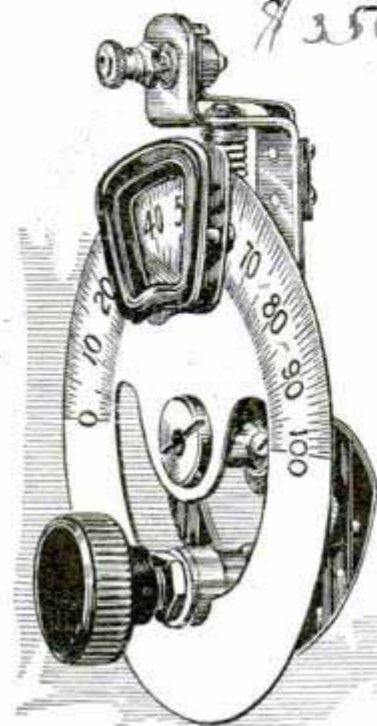
Loose connections make jarring and rattling noises in the horn or phones; examine each wire to find out which is loose. Use a small wood rod for this purpose, never a screwdriver or metal tool. With the headphones on and the set in operation, move each wire slightly with the wooden stick; a loud sound will be heard when the loose wire is moved. It can then be secured by soldering or turning down the terminal post to which it is connected. When making corrections in a set, which require a metal tool, first disconnect the A and B-batteries, as otherwise the tool will cause a short circuit that will blow out the tubes.

995-
 Battery Corp.
 2,000 Shadown Ave. Chicago
 Vesta

Norden. Hauck & Co.
 1617 Chestnut St

1051 *Providence, A.C.*
"Back-Panel" Dial Beautifies Set

Heretofore the behind-the-panel type of dial has only appeared in commercially



manufactured sets, but it is now available for the amateur builder. This dial combines a number of new ideas and is easily mounted. It is made of celluloid and is $4\frac{3}{4}$ in. in diameter. The scale is graduated to half degrees and is read through a bakelite window with a transparent

celluloid cover marked with a hair-line indicator. The control is supported on the panel by means of bushings through which the vernier knob and the miniature switch project. Directly behind the window and back of the dial, a standard 6-volt miniature lamp is mounted. This lamp is lighted directly from the 6-volt A-battery and is turned on and off by the switch above the window. A steel template, with a series of holes close together is provided for use as a guide in drilling the hole in the panel for the window.

Quickly Improvised Tube Protector

Thousands of dollars worth of vacuum tubes are burned out annually by radio owners who accidentally short the B-current across the filament when testing batteries, making adjustments, etc. A protector which will guard against this occurrence may be thrown together quickly whenever a set is to be gone over, or tested, and where it is desired to work with the B-battery connected to check up on operation. Simply place a small glass of water near the B-battery, disconnect the lead—either positive or negative will do—and bend it over the edge of the glass

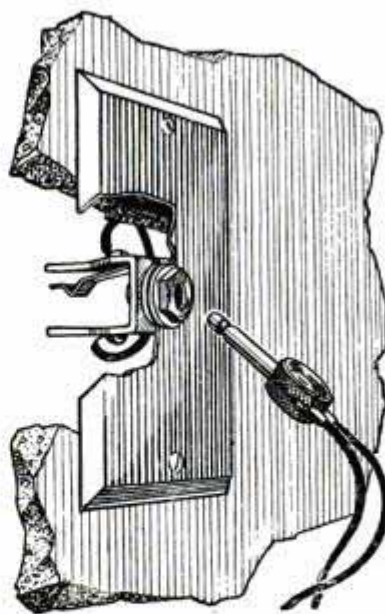
so that the stripped end will be in the water. Cut another short piece of wire and fasten it to the battery, putting the end in the water opposite the other wire but not touching it. The result is a resistance which will pass the necessary current for tube operation, but not for burning out filaments. If the resistance is too high, causing shrill whistling of the tubes, fasten a small clip or binding post to each wire end, or move wires closer together. —Floyd A. Meek, Rockbridge, Ill.

Replacing Crystals

Owners of crystal sets often complain that the crystal loses its efficiency after some time's use. Cleaning with alcohol or benzine may partly restore its former efficiency, but as the renewal cost is small, it is a good idea to replace them when they have lost their sensitivity. Inclosed crystals will give the longest service. These may be had at a very reasonable price, and as the crystal is the only part of the set representing maintenance cost, a few extras should be kept on hand.

Radio Jack in Outlet Plate

Radio outlets for loud speakers or phones to be used in various parts of the house may be made from old outlet plates. The illustration shows such a plate with a short-type jack fitted in a hole drilled to suit. When wired so that the plate is flush with the wall or baseboard the plates make a neat appearance in any room, doing



away with the unsightly wires so frequently seen in average installations. Outlets of this type may also be wired for aerial and ground wires if desired.—H. R. Wallin, Woodhaven, N. Y.

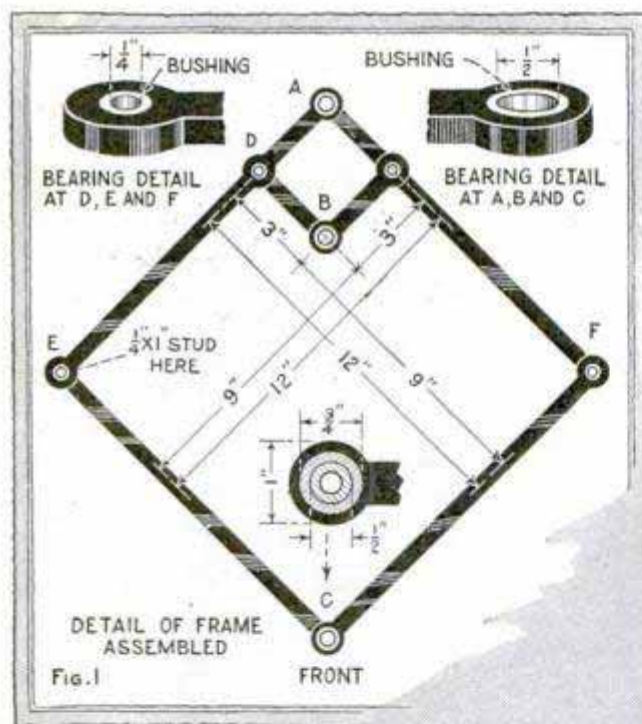
Make Your Own Engraving Machine

By HARRY F. BLAIR

DEALERS and small manufacturers of radio sets who do not feel justified in purchasing a regular engraving machine, can make one, for approximately \$50, and if the job is done exactly according to the instructions in this article, it will do the work just as well as the commercial article. It is designed on the pantograph principle of copying drawings from a template which is larger than the size of the finished work. The reducing mechanism consists of six arms made of $\frac{1}{2}$ by $\frac{1}{4}$ -in. flat steel, shown in Fig. 2. These are forged, drilled and fitted with bushings at the ends, and other points indicated in the drawing, and assembled as shown in Fig. 1. It is not ad-

the frame directly over bushing B, Fig. 1, and is held rigidly in place by means of a support made of $\frac{1}{4}$ by $\frac{1}{2}$ -in. steel, bent to the shape shown in Fig. 4. Of course, small motors that can be used for this purpose have different shapes and sizes, and in each case the exact dimensions of the support must be determined. The details of the motor-shaft and spindle housings, and the chuck that holds the engraving tool are also shown in Fig. 4. The chuck is made simply by drilling a hole along the axis of the spindle, then cutting a taper thread on the spindle nose, slotting the end, and fitting a compression nut, which is locked by a setscrew. The guide pin, which is drawn over the template, is mounted at C in Fig. 1, and the details of its construction are shown in Fig. 3.

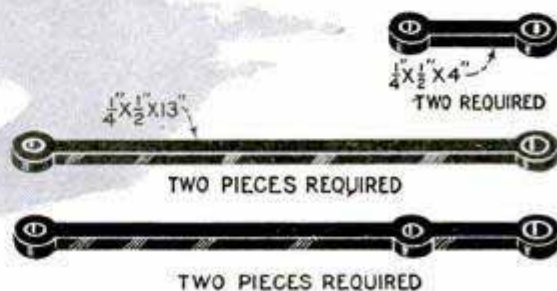
When a panel is being engraved, it is necessary to hold it securely and for this purpose the clamps shown in Fig. 5 are provided. They consist of $\frac{1}{16}$ by $1\frac{1}{8}$ by 10-in. strips of spring steel and are screwed to the bench top together with $\frac{1}{2}$ by 2-in. fiber disks, or washers, used as spacers.



Homemade Machine for Engraving Radio Panels Will Be Found Useful by Dealers and Small Manufacturers; Fig. 1 Shows the Reducing Mechanism, Which Consists of the Separate Members Shown in Fig. 2

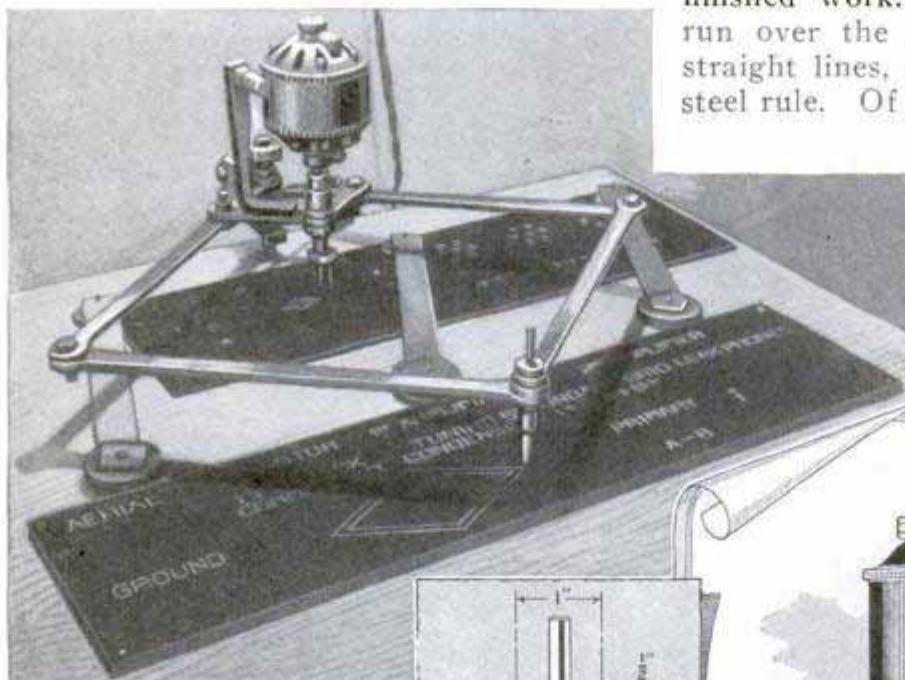
visible to use heavier stock for the arms as this would add unnecessary weight to the instrument, making it more difficult to handle. A $\frac{1}{8}$ -hp. electric motor, of the kind used for sewing machines, provides sufficient speed and power for all radio engraving. The motor is mounted on

Fig. 2



The other end of the strips are also provided with fiber disks to prevent scratching the panels.

A snap switch, mounted underneath the bench top, cuts off the current when the machine is not in use. However, it is rather unhandy to turn the switch off each time the frame of the machine is swung back to insert a new panel, and for this reason an additional switch, which cuts the current off automatically when it is not needed, is provided. This switch is of the knife type and is indicated by A, Fig. 5, and the wiring diagram is also clearly shown here. Obviously, the switch engages only when the frame of the machine is nearly horizontal and ready to be used for work.



The Photo Shows the Engraving Machine Ready for Operation with the Template and the Panel in Place; Figs. 3 and 4 Show All Constructional Details of the Guide Pin and the Motor and Chuck Spindles

The bracket assembly that holds the machine to the bench top consists of three separate pieces, which are shown in Fig. 5. First the bracket-rod support is screwed to the edge of the bench top and the bracket rod is inserted in it, a thumbscrew being used to hold it securely. Then the bracket, shown in the lower right-hand detail, is mounted in the slot in the bracket

rod so that it pivots easily, and the bearing for the reducing mechanism pivoted in place. The latter is made up in the same manner as the tracer or guide pin. A $\frac{3}{32}$ -in. high-speed drill is used for the engraving tool, and Chinese white, jewelers' white or ordinary moistened white chalk is rubbed over the engraved section. As soon as this is dry, the surplus whiting can be removed with a clean, dry cloth.

The template letters and designs are, of course, much larger than the actual work, and are cut deep so that the guide pin will not slip out easily. The template, which should be of bakelite, is engraved first, about four times larger than the work. To do this, it is necessary to use a cardboard template four times larger than the finished work. When the guide pin is run over the cardboard template along straight lines, it can be slid along a flat, steel rule. Of course, the cardboard tem-

plate must be tacked down on the bench top when the work is being done, and similarly the bakelite template must be clamped down, both when it is being en-

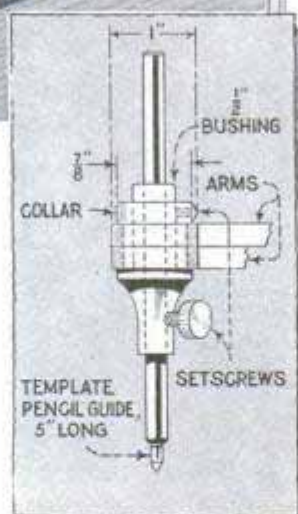


Fig. 3

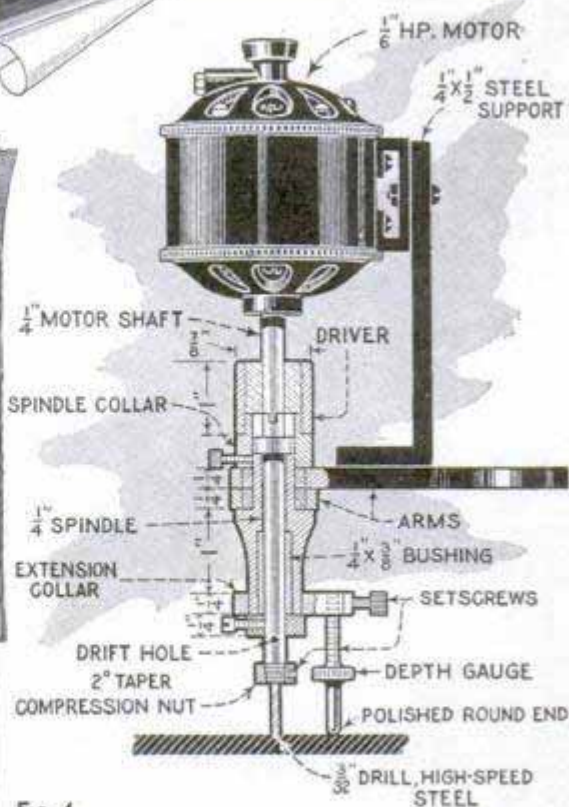


Fig. 4

graved and when it is used as a template. It is a good idea to practice using the machine on waste pieces of bakelite, hard rubber or formica, as it is necessary to experiment somewhat with the depth of cut and the method of doing the

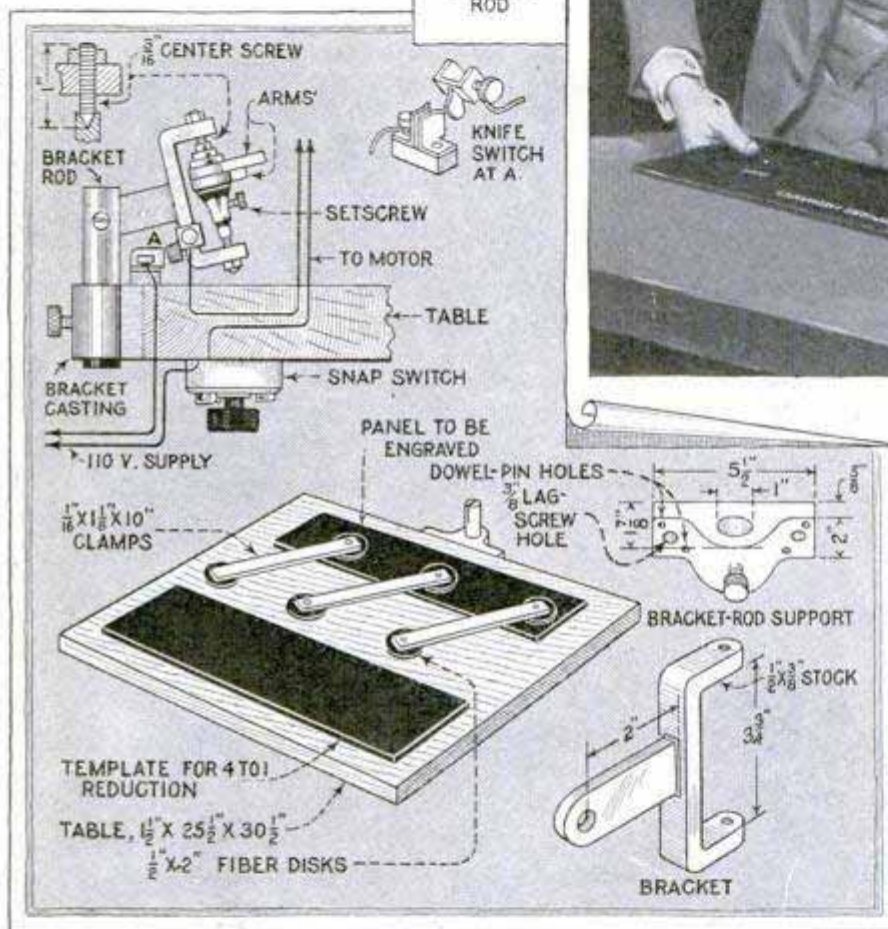


Fig. 5, the Bracket Assembly That Holds the Machine to the Bench Top, an Automatic Switch That Shuts Off the Current When the Frame Is Swung Back, a Snap Switch to Cut Out the Current When Machine Is Not Used, and Spring Clamps for Holding the Panels

Depth adjustments of the cut are made with the depth gauge, which has a polished, round end to prevent marring or scratching the surface of the panel. Too deep

work. The guide pin should have a very slightly rounded point, which must fit in the template lettering without any play.

a cut may easily chip the edges, and if it is made too shallow, it will not hold the whiting.

Using the Auto Battery for the Radio Set

While taking an auto tour, the radio fan will want to use the auto storage battery for his radio set. This can be done simply by attaching a headlight plug to the A-battery connecting wires of the set. When it is desired to use the radio set, it is necessary only to remove the dash-light bulb, and insert the plug in the proper manner; that is, positive and negative connections should be correct or the set

will not operate. One can easily determine which is which by examining the socket connecting wires. The negative side of the light is generally grounded. If there is only one connection to the light, the other connection must be taken off the metal frame of the car, or a special brass-shelled plug used. The trouble light is usually a two-way socket type, and will therefore work without any alteration other than the insertion of the plug in place of the bulb.

A. F. Transformer Is Variable

Audio-frequency transformers that are variable may now be obtained and adjusted to match the characteristics of the

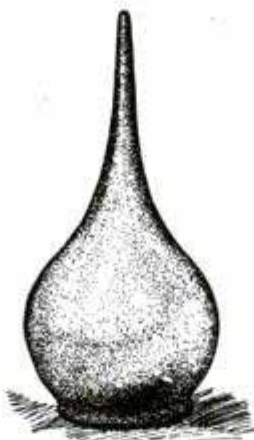


particular tube used. They may be used in any set, in the detector circuit and in any or all stages of amplification. The method of using them is very simple. Merely turn the knob

shown on the top of the transformer until reception is clearest and sharpest. It is claimed that all squeals and howls are eliminated, giving perfect reproduction.

Water Bulb for Storage B-Batteries

A water bulb for adding distilled water is a handy adjunct to the equipment of all who use this type of B-battery. An ordinary rubber ear syringe, which can be obtained at any drug store, will serve very well. With the bulb, the water level can be maintained without the spilling which invariably accompanies the adding of water to these small cells with a glass or cup.



Supersensitive Detector Tube

A new detector tube known as the UX-200A is announced. It is described as supersensitive, non-critical and economical in operation and is claimed to greatly increase the reception range of the average broadcast receiver. In appearance it is similar to the 201A-type, except that instead of a plain or silvered bulb, the UX-200A has a bluish or smoky color, due to a special gas content. This difference in color gives a means of iden-

tification. High sensitivity has been the keynote in the design of this new tube, and economy of operation has been obtained as the tube requires only $\frac{1}{4}$ amp. at 5 volts, as is the case with the 201A-type now in common use. No change or special adjustment in the circuit is necessary to use the new tube; its internal resistance is such that it may be used with either resistance or transformer coupling. The B-battery recommended is 45 volts, although lower voltage may be used. A 10-ohm rheostat should be employed to regulate the filament current, and the suggested gridleak and grid condenser are 2 meg. and .00025 mfd. respectively. It is claimed that actual tests show the new tube provides an increase in volume equal to an extra stage of r. f. amplification.

Adapting Loop Set to Outside Aerial

Users of loop sets are sometimes at a loss to know how to adapt their set to an outside aerial. This is a simple matter, but requires some means of properly tuning the aerial, as no such device is used with the set designed for a loop. The necessary aerial coupling unit can be wound on a bakelite or cardboard tube, 3 in. in diameter. The primary should consist of 10 turns of No. 22 c.c. wire and the secondary should have 60 turns of the same size wire, spaced $1\frac{1}{2}$ in. from the primary. The primary coil is connected to the outside aerial and ground, the loop removed and the secondary lead connected to the loop posts on the set.

Insulator of Novel Design Prevents Leaks

A new insulator, designed to prevent leaks caused by rain, snow, ice and dust, consists of two highly glazed porcelain



units mounted on opposite ends of a metal yoke. The two impor-

tant features of its design are the air gap and petticoat construction. The claim is made that, under a test of 10,000 volts at 1,000,000 cycles for a period of three minutes, this insulator showed no change, and no noticeable heat after the test.

Radio Corporation of America
223 Broadway New York

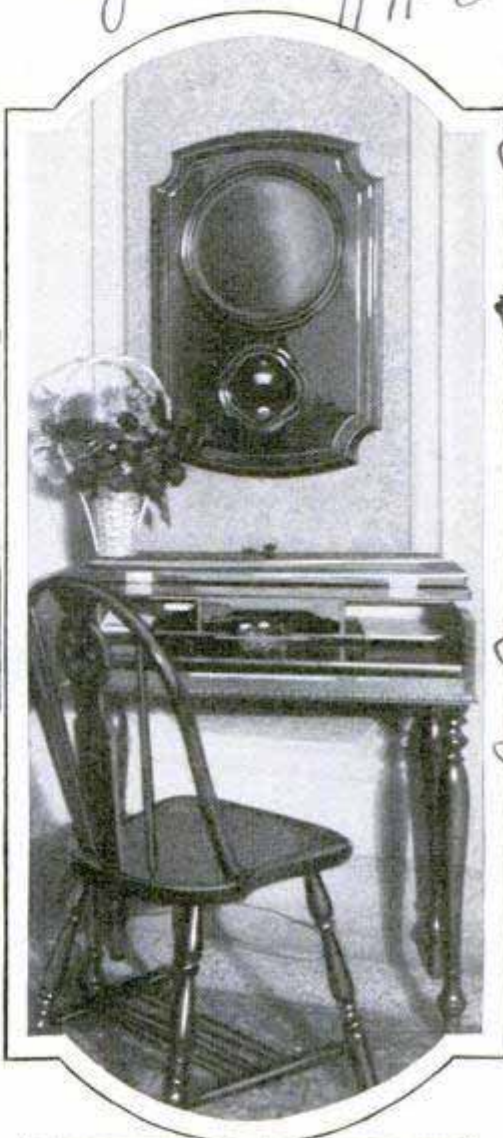
Professional Aerial Int'l. Co.
Swine Antileak Aerial Int'l. Co.
new Britain, Conn.

Curled by Sherman Albert
George Frager, Los Angeles
Radio Happenings Far and Near

Radio
Ces

1191-Q

1171-Q



A. J. Agutter Co. Co.
1404 North Ave.
Siade, W.

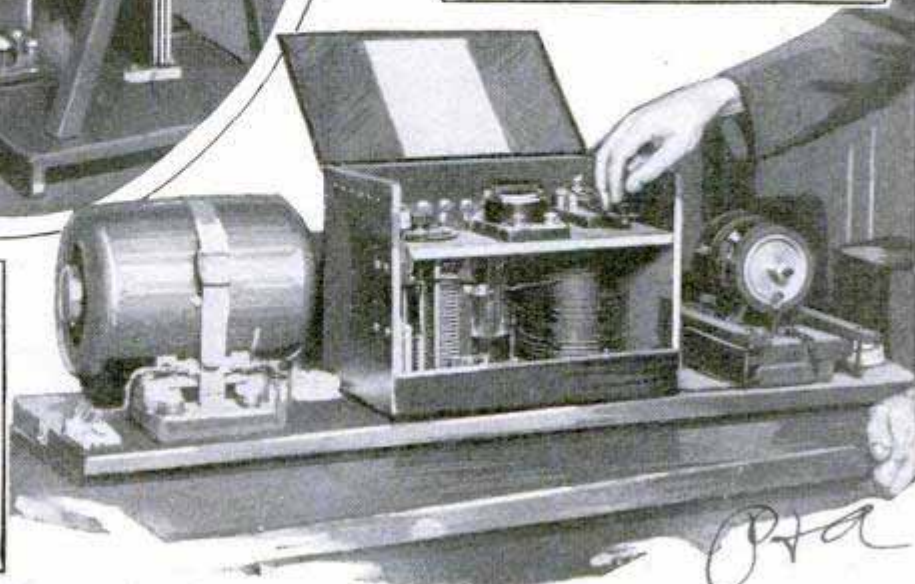


1113-Q

Upper Left, Twelve-Year-Old Los Angeles Boy Finds His Toy Dog Makes a Good Mounting for His Crystal Set; Above, Attractive Panel; Radio Set in Lobby of Apartment Hotel Serves Over 100 Apartments

Herbert

Above, One-Meter Transmitter Operates on House Current; the Square Disks Are Condensers Adjusted for This Wavelength; the Tube Is Contained in Shield behind Meter Shown at Center; Right, Bureau of Standards Portable Broadcasting Station Used in Calibrating Direction Finders on Ships



1037
 Q.

OTA

B-Current from Your A-Battery

A novel and highly efficient motor-generator of English make solves the B-battery problem for those who have no house

standard 201-A tubes. The device is designed to avoid transmission of vibration from the running machine to the set, all moving parts being mounted on rubber feet and the entire machine inclosed in a metal case of pleasing design. Several larger types for multi-tube sets are also made, delivering up to 300 volts of B-current. This requires a 12-volt A-battery and the drain on this would be 1.6 amp. Other types supply only a single value of B-voltage, the largest delivering up to 500 volts. This is powerful enough for low-power transmitters.

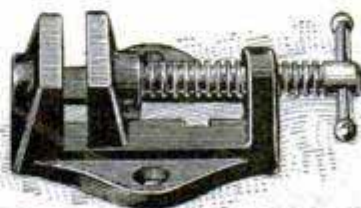
Eliminating Whistles

Sets will sometimes operate perfectly for some time and then suddenly develop a continuous "whistle," varying in pitch from a high note to a coarse roar. The most common cause of this trouble is worn-out or defective B-batteries, but

a new battery can cause the same trouble if one of the cells is defective. Three stages of transformer-coupled a. f. amplification will cause the same whistle, due to distortion, and for this reason, very few sets have more than two stages of amplification; some of the late sets have only one, or, if two are used, the second stage is of a very low ratio.

Handy Vise for the Radio Builder

A small vise especially adapted for radio work, is now offered to home builders. It takes up very little space and can be utilized for all kinds of small work. The jaws are 1½ in. wide and the extension when open is 1¾ in., sufficiently large to handle parts to be filed or drilled.



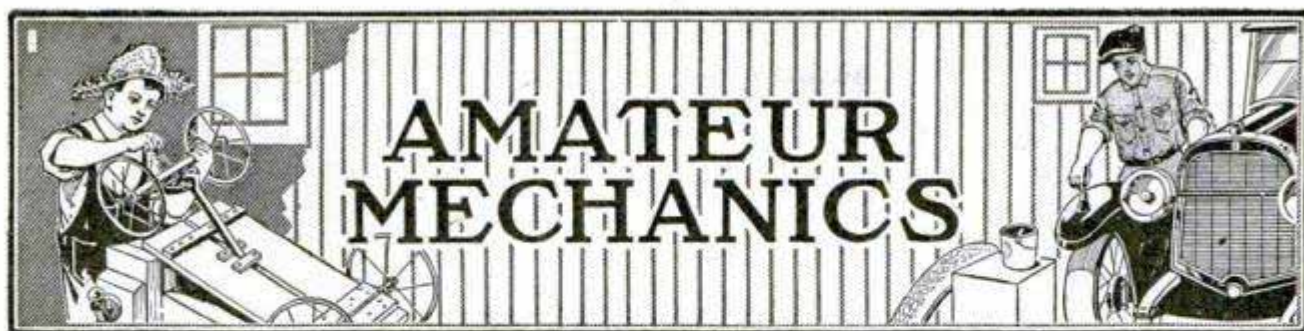
Above, Motor Generator Showing B-Supply Terminals and Selector Switch at Front; Below, Top Removed, Showing Compact Assembly

current. The instrument is connected to the terminals of the A-battery, the B-current is then taken from the terminals shown at the end of the unit in the upper photo. The switch is for the purpose of varying the detector plate voltage, r. f. amplifier and audio-amplifier tubes. Driven by a six-volt A-battery, the converter will deliver up to 120 volts and 25 milliamperes of B-current. The principle of the machine is simple. The A-battery current drives a small electric motor, permanent magnets of special cobalt steel, which has high magnetic retentivity, provide the field, the rotor carrying a double winding, of which one section belongs to the motor circuit, and the other is the high-tension generator winding. With this arrangement, one set of magnets supplies the field for both the motor and generator, and no current is wasted in setting up this field. The drain on the storage A-battery is only 1.3 amp. or slightly more than the amount necessary to operate four of the

foreign correspondence C.F.
handled by - m. & magneto

C. Stearns Co

Chas. Stearns Co



Valance Boards Are the Vogue

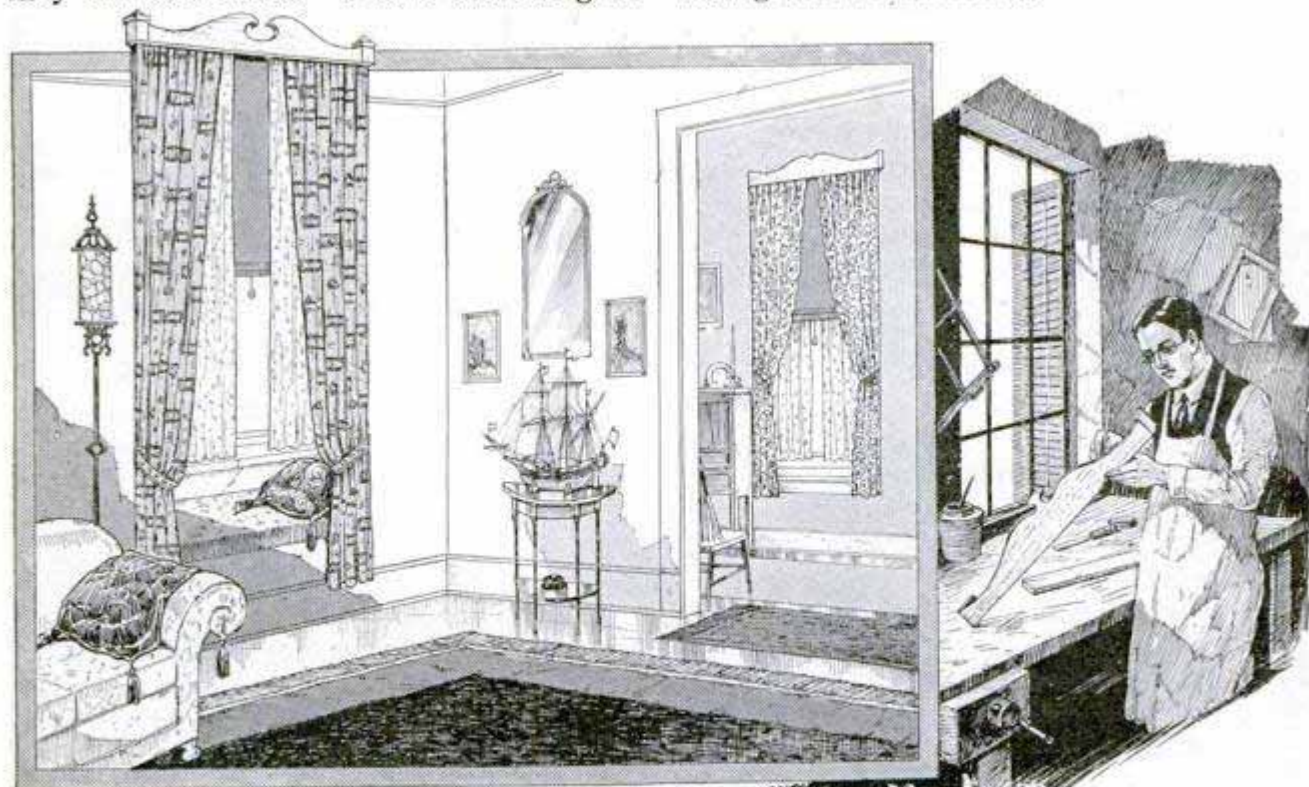
By RALPH O. BUCK

FEW of the decorations of former days lent so much charm and livableness to a room as the quaint valance boards which crowned each window. Interior decorators are suggesting and using valance boards a great deal these days, but unfortunately we cannot all afford this valuable service, nor are we always able to secure many of the things we would like for our homes in the locality in which we live. It is here that the homemaker with an artistic bent and some small ability with tools can make for himself what he must otherwise do without.

Your valance boards must harmonize with the furnishings of the room in which they are to be used. I have tried to give

you typical examples so that you may have the pleasure of designing your own along the general lines of the suggested type you select. Make a full-size paper pattern about $\frac{1}{2}$ -in. longer than the cap or head trim of your window, and about 6 in. wide. The next step is to sketch your design on the pattern after having folded it in the center. Cut out the design, trim and fit until the desired effect is produced.

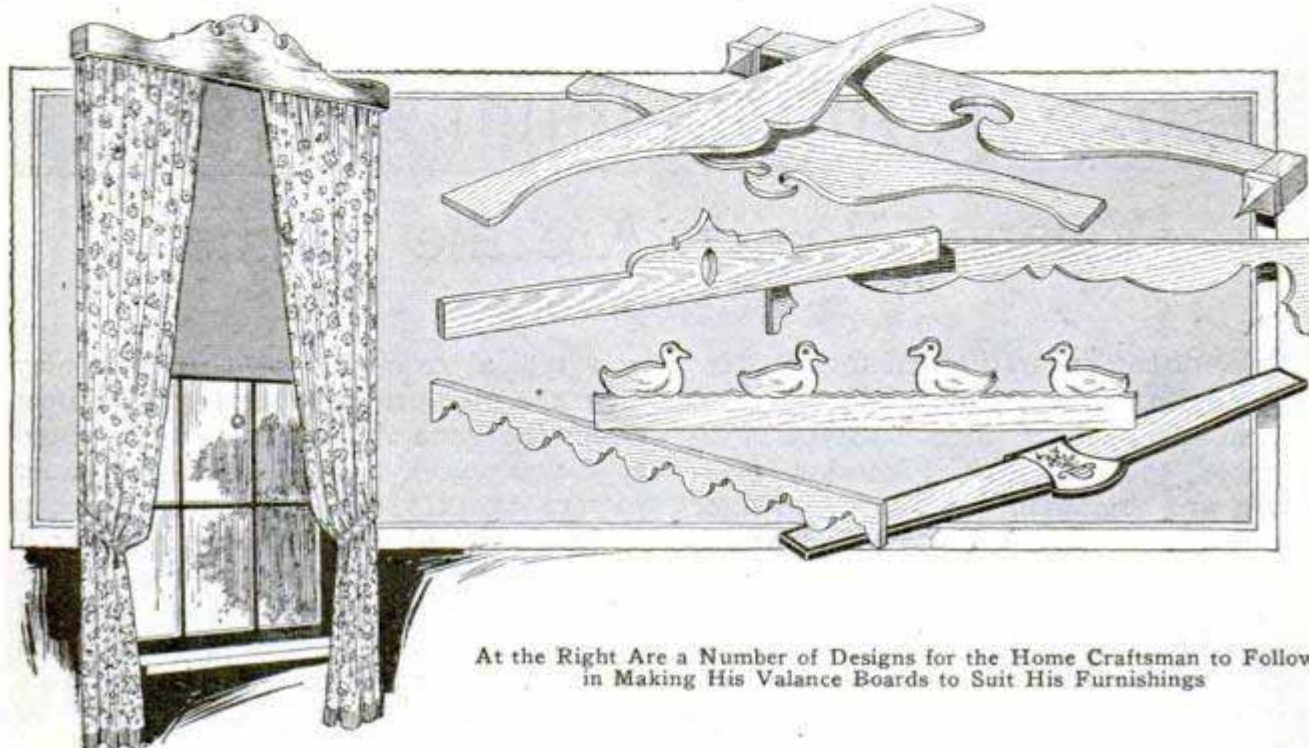
Little boards, as high as the width of the pattern at the ends and about 3 in. wide, are tacked to the valance boards to finish the ends. A hook fastened between the top of the board and the head casing will keep the former in place without defacing the woodwork.



These Valance Boards Are Very Simple to Make, Yet Give a Touch Reminiscent of Colonial Days to the Home, and Besides, Are Very Much in Vogue

Any thin wood, or wallboard, may be used as material, but a $\frac{3}{16}$ or $\frac{1}{4}$ -in. piece of ply wood is preferable, because of the greater strength and the fact that it usu-

ally is finished smoother than you are likely to have facilities for doing.



At the Right Are a Number of Designs for the Home Craftsman to Follow in Making His Valance Boards to Suit His Furnishings

ally is finished smoother than you are likely to have facilities for doing.

Valance boards may be finished in several ways. Stain, enamel, lacquer or a covering of fabric to match or harmonize with the drapes are all used effectively. The finish, of course, will depend to some extent on the type of board you select. Stencils and transfer designs are easily applied and may be obtained at most art stores, although a hand-painted design is usually more pleasing.

The board shown at the left in the first

be used with rather simple drapes and furnishings, while the one on the left, below, should crown heavy, straight-hung drapes. The more elaborate design to the right of this can be used with colonial furnishings to advantage, while the duck design, painted in bright colors, will be attractive for the nursery. Of the two designs at the bottom, that on the left goes well with a row of casement windows, and the one on the right, with a basket of flowers on a dark background painted on it, adds to the appearance of bright drapes.

Abrasion Marks on Prints

Abrasion marks on photos are a source of trouble to many amateur photographers. They are caused by a defect in the emulsion and appear on the developed print as black or dark lines. One well-known remedy is to rub the marks with alcohol until they disappear. However, they cannot always be eradicated by this method, but "Bon Ami," or similar compound, can be used with better results. Dampen a clean cloth with alcohol and rub it on the cake; then scrub the abrasion marks lightly but firmly, being careful not to scratch the

emulsion. A slight circular motion will be found best. When the marks disappear, wipe off the soap with a clean cloth dipped in alcohol.—L. B. Robbins, Harwich, Mass.

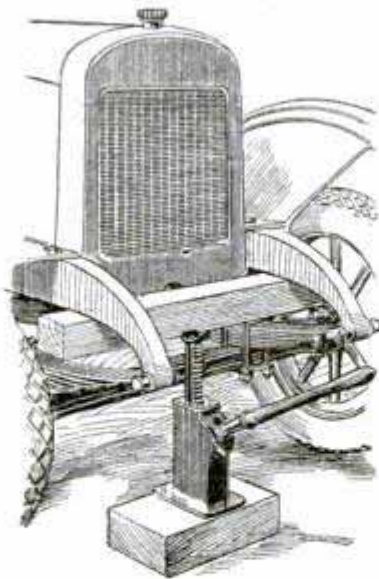
How Furniture Should Be Polished

There are many kinds of furniture polish, but those to be described will meet the needs of the amateur in every way. Practically the same methods are employed in applying all of these polishes. Clean the surface to be polished with cold water and good soap to remove all grease and finger marks, then dry it thoroughly

and immediately apply the polish with a clean lintless rag and rub it perfectly dry with cheesecloth. A small 10-cent varnish brush can be used to apply the polish to the moldings and the carved work. All mildew, medicine and water marks should first be removed from the surface by rubbing all of these spots with pumice-stone and linseed oil mixed in an old saucer to a light, creamy mass, and then applied with a rag to the affected parts and rubbed in the direction of the grain of the wood. A very good polish can be made by filling a bottle with two-thirds of linseed oil and one-third of turpentine. When shaken well and applied to the wood, the turpentine will clean and the oil will polish the wood. Crude oil, thinly applied and rubbed out well, also is a cheap and good polish. If a beautiful velvety finish is desired, mix rottenstone to an easy flowing mass with pure linseed oil and rub it over the surface of the work with a piece of an old felt hat. Then remove the oil with clean, dry rags, and polish the surface with clean cloth.—Francis W. Henry, Pottsville, Pa.

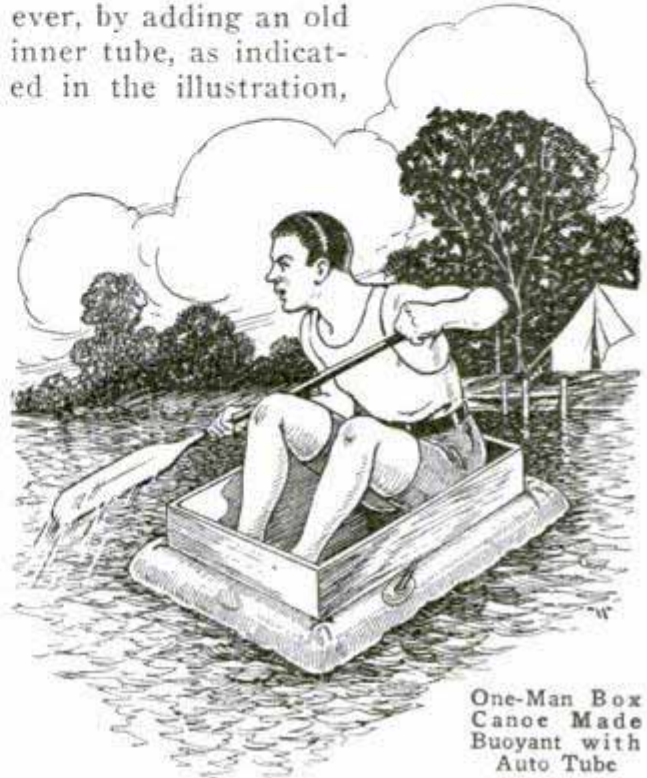
Oiling Auto Springs

Lubrication of auto springs is often neglected as the oil cannot be applied easily between the leaves without spreading them apart. About the easiest method of doing this, except using a special tool, is shown in the drawing. A crosspiece of 2 by 4-in. material, or any wood or iron of sufficient thickness, is slipped under the frame as indicated, and a jack is applied under it. As the body of the car is raised the weight of the wheels will pull the leaves apart, and permit oiling them without difficulty.—G. A. Luers, Washington, D. C.



Buoyant One-Man Pond Raft

When used as a boat or raft, an ordinary dry-goods box, even though it be watertight, is unstable and readily tips due to its small size. However, by adding an old inner tube, as indicated in the illustration,



One-Man Box
Canoe Made
Buoyant with
Auto Tube

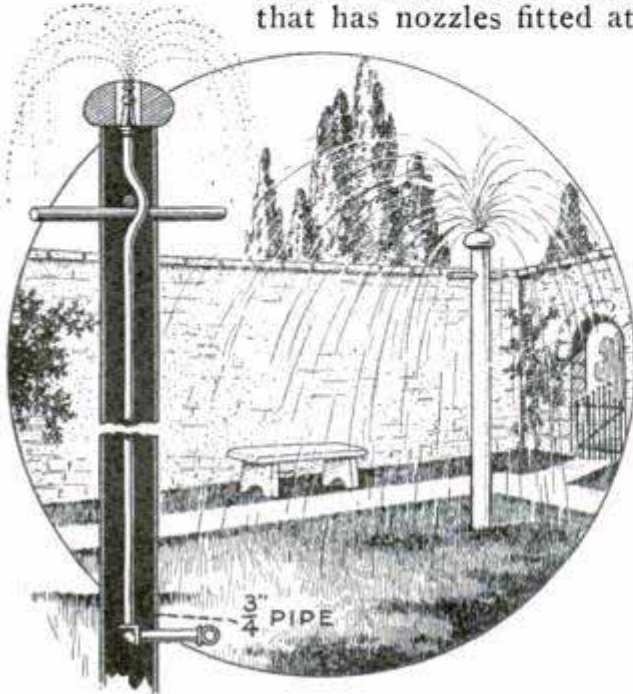
this trouble is eliminated. Get a box, which is large enough to sit in comfortably, and about 20 in. deep. The boards should be tongue-and-grooved stock if possible. Even then it will require two or possibly three coats of paint or preferably tar, to make the box water-tight. Calk the larger cracks first with tarred hemp or rope. After painting, stretch the inner tube around the box until it is about 8 in. below the upper edge. Then inflate the tube until it is round, except at the corners. Should the tube be too large to stay in place readily, tack small strips of wood just above it on all four sides. You will be surprised at the ease with which you can manipulate this raft without shipping any water.—Dale R. Van Horn, Walton, Nebr.

Flexible Shellac

Shellac, which is valuable as a patcher, has one disadvantage—it becomes brittle as it hardens. To avoid this, add 10 or 15 per cent castor oil to the shellac after it has been dissolved in alcohol. The shellac will then remain flexible after drying.

Clothesline Poles of Piping Serve as Lawn Sprinklers

Clothesline poles of piping can be made to do double duty by fitting them on the inside with water pipe that has nozzles fitted at



Installation of Water Pipe in Clothesline Poles Makes Them Serve as Lawn Sprinklers

the top, to serve as lawn sprinklers. The top cap of each pole is removed and drilled out to permit adjustment of the nozzle. It will be noted that only one hole need be drilled in the side of the pole. A length of $\frac{3}{4}$ -in. pipe with an elbow at the lower end is let down inside of the pole and a short piece screwed in from the side, as indicated. A bend is made to fit around the crossarm of the pole. The cap is then slipped over the nozzle and screwed into the pipe. This method of spraying any lawn is much to be preferred to holding a hose in the hand, as a finer spray can be used and a great deal of work is spared the home owner.—L. H. Georger, Buffalo, N. Y.

How to Paint New Work

When painting new work, all projections, such as lumps of glue and other matter, must first be removed from the surface. Apply a thin coat of shellac to all knots so that the pitch and turpentine in the wood will not eat through and spoil the finishing coats. It is advisable to buy ready-mixed paints of the desired

shades, especially if you have no experience in mixing and combining colors. After the knots have been shellacked, a thin coat of the paint is applied over the entire surface. This is called the first, or priming, coat and should be thinner than the following coats. It is made by pouring some of the paint into another pail, thinning it with turpentine and adding a teaspoonful of Japan drier to each pint of the liquid. After the priming coat has dried, all small holes should be puttied and the entire surface lightly sanded in the direction of the grain of the wood, with No. 1 sandpaper, and carefully dusted off before applying the next coat of paint. If the putty is applied before the priming coat, it will not adhere to the wood and will fall out of the holes. The paint should be applied in the direction of the grain of the wood, taking care to prevent brush marks. When painting inside doors, blinds or panel work, always paint the panels first, the crosspieces next and the uprights, or stiles, last. Use a small brush for the moldings and corners, and a larger one for the flat surfaces.—Francis W. Henry, Pottsville, Pa.

Door Closer Made from Mousetrap

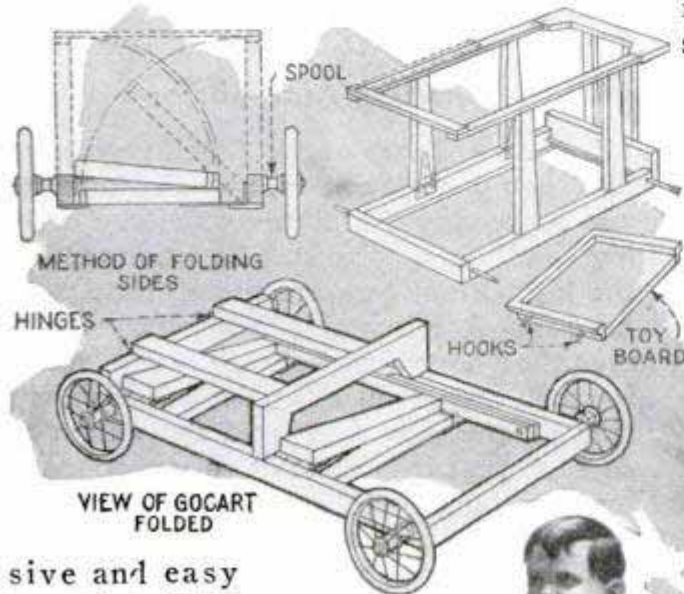
We had a door that we wanted to keep closed and not having any suitable ready-made device at hand for the purpose, I made one from a spring rat trap. I sawed off the bait end of the trap, as shown, and screwed the remaining part to the door casing.

The spring thus extended over the edge of the door next to it, which I protected against marring by a light piece of tin. This door closer works perfectly, and is cheap.—W. C. Loy, Rochester, Ind.



Combination Gocart, Baby Bed and Walker

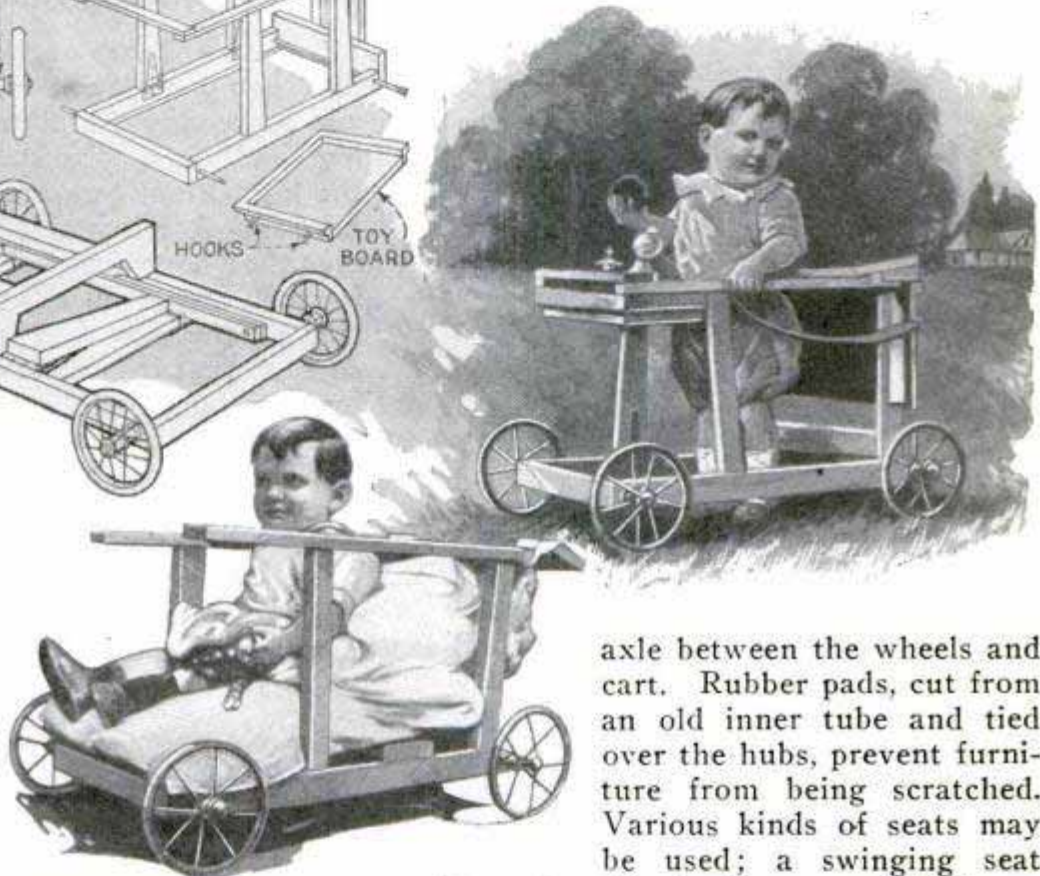
The handiest article I have ever seen in the way of a baby vehicle is the combination gocart, baby bed and walker shown in the illustration. It is inexpen-



sive and easy to make. Two posts on one side of the cart are fastened to its base and fitted with a bare-faced tenon as shown, the hinges on this side being screwed to the bottom of the post and to the

bottom side of the base. The other two posts are hinged on top of the base so that they will fold over the other side. The board used for the rear base should be about twice as wide as the sidepieces, so that the rear end will fold over the side sections. As shown in the photo, the hinges are fastened to the outside and top of this board and to the bottom of the posts, so that they will fold either in or out. By putting the hinges on in this way, the rear section can be folded over the two side sections, or outward so that it may be lowered and held in place with straps when used for a bed. The top of the cart extends forward and a table for toys can be attached to this extension. The table is made of veneer or thin board and molding and is fastened with hooks so that it can be removed

when the cart is folded. Any odds and ends about the home can be used to make it. The size of the wheels and axles is immaterial, the axles being threaded or drilled to hold the wheels on. The rods should be cut long enough to extend 1 in. or so beyond the sides of the cart, and sewing-thread spools are slipped over the



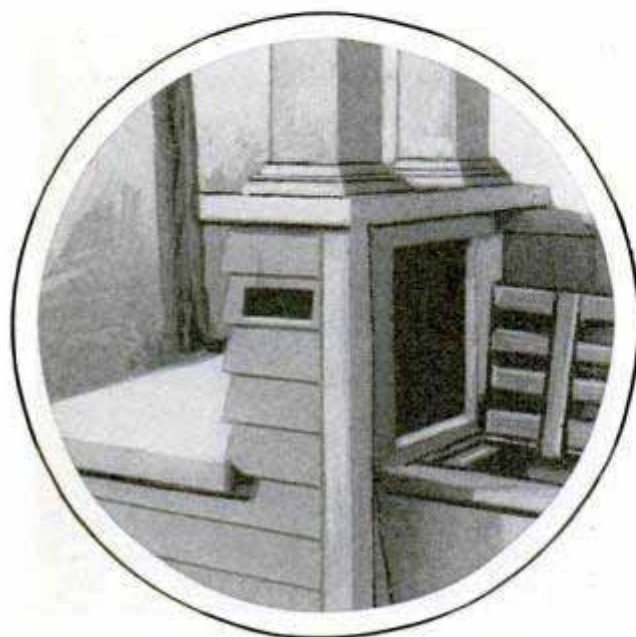
Combination Gocart, Baby Bed and Walker Can Be Used Both Indoors and Outdoors

axle between the wheels and cart. Rubber pads, cut from an old inner tube and tied over the hubs, prevent furniture from being scratched. Various kinds of seats may be used; a swinging seat attached by means of straps, or a piece of strong elastic buckled or pinned on with strong safety pins. The cart may be used for teaching the baby to sit alone, the swinging seat being lowered to the floor and used as a balancer. At a very early age, long before the infant is strong enough to carry very much weight on its feet, it learns to push the cart. The cart can be strapped to the seat or placed on the floor of an automobile and, if the seat is made of a baby swing or something similar, the child cannot possibly fall or be thrown out of it.

The same construction may be used to make a cart that does not fold, using small nails or screws instead of hinges. If the cost of rubber-tired wheels is considered too high, ordinary casters will be found equally satisfactory.—Rose Scandlyn-Benziger, Knoxville, Tenn.

Make Your Porch Convenient

One of the most attractive porches in our town offers both convenience and utility. There is a porch bench on each



Built-In Mail Box and Recess under Seat Add to Convenience and Utility of Porch

side and the seat is hinged, forming the top of a recess in which rubbers and umbrellas may be stored. The mail box is also a built-in feature. It is out of the way and out of sight, and is convenient for both mail man and owner. The details are clearly shown in the photo.—Mrs. Ruth Darling Shultis, Albion, Mich.

Protectors for Iron Tent Stakes

Iron stakes have been generally adopted by auto campers. The form made from light channel iron is widely used, but it has one disadvantage: The top soon becomes battered, making the edges so sharp that they are dangerous. During a camping trip last summer, one of the children who was barefoot, stepped on a stake and was injured. A short time later one of the grown folks had a rubber torn off by coming in contact with a stake. As a result of these experiences, we determined to provide some sort of protectors. After some search for the proper



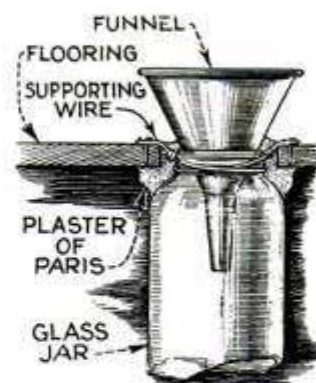
thing, the idea of using short pieces of $\frac{3}{4}$ -in. garden hose was suggested and tried. Each one was $2\frac{3}{4}$ in. long and a $\frac{1}{2}$ by $1\frac{1}{4}$ -in. hole was cut in the side. This rubber guard is slipped over the top of the stake after it has been driven in.—H. D. Edwards, Huntington, W. Va.

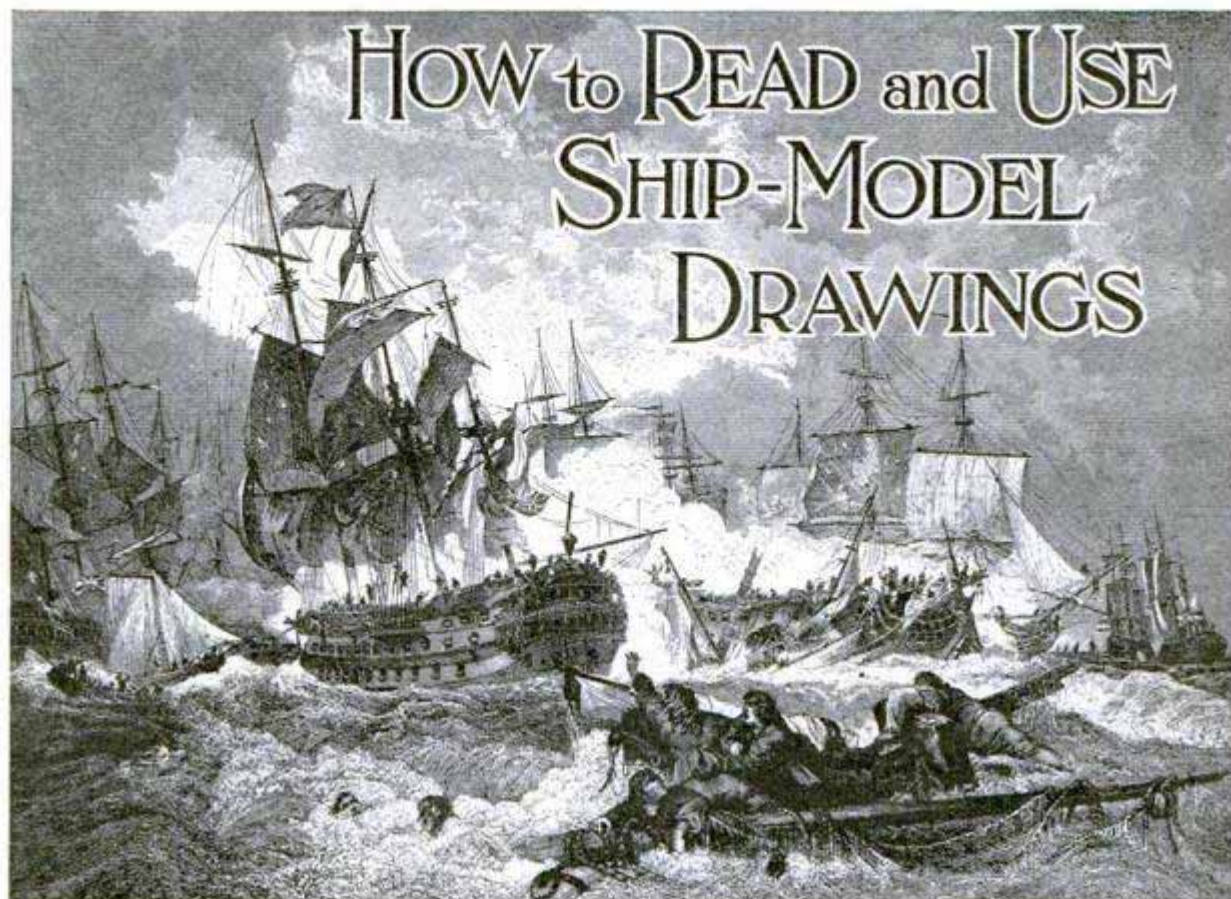
Lowering Auto Mirror

Older Ford cars of the closed type were not equipped with rear-view mirrors, which are very useful under modern driving conditions. The standard mirrors for the late closed cars are quite cheap, and have good, adjustable brackets. However, the wooden strip above the windshield is much higher on the older models than it is on the new ones, and the mirror is so high that it is difficult to use it. A 5 by 6-in. board of 1-in. thickness can be screwed to the wooden headpiece and the mirror bracket attached to this with wood-screws. This will lower the mirror about 2 in. and make it much easier to see. If the edges of the board are beveled, it can be painted or varnished.—E. T. Gunderson, Humboldt, Iowa.

Vermin-Proof Icebox Drain

Cockroaches and other vermin will not get into the icebox through the drain, if it is arranged as shown in the drawing. Punch the bottom out of a glass jar. Do not attempt to knock it off, but, resting the jar bottom on soft earth, punch out the bottom with an iron rod. Enlarge the drain hole in the floor to receive the jar, as shown, using wire, nailed to the floor, to hold it in place. Seal all openings around the neck with plaster of paris. A funnel may be used to catch the drippings from the icebox or, if desired, a pipe leading to a drain in the cellar may be used as long as it does not extend up through the floor. The insects will then be unable to climb up the glass.—W. F. Saunders, St. Louis, Mo.





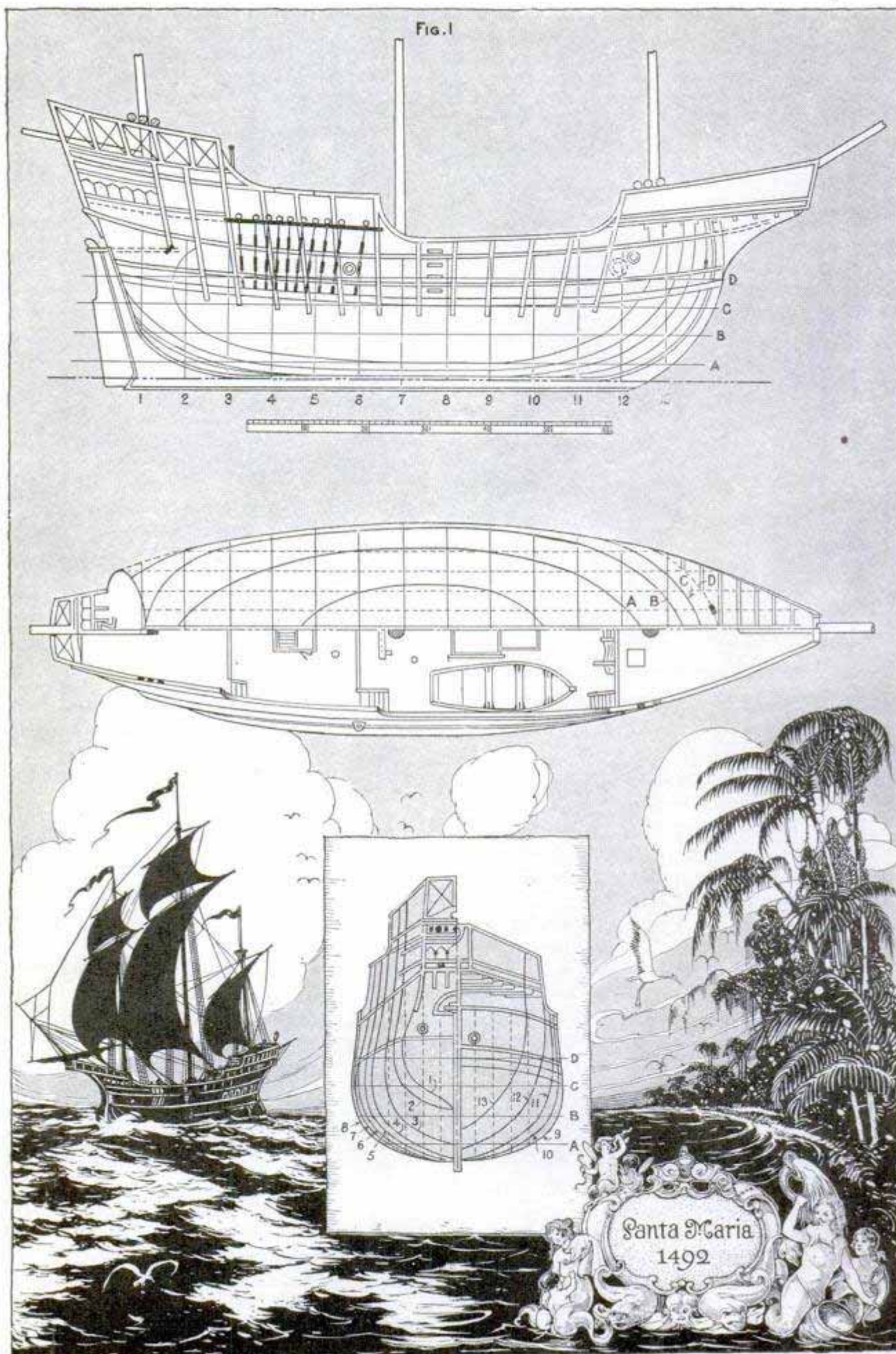
Admiral Duncan's Victory over the Dutch Fleet, 1797, from an engraving by J. Rogers

By JAMES TATE

BLUEPRINTS and drawings for almost every type of ship that the model enthusiast desires to make are easily obtained, but the amateur, who has been fired with the ambition to make a model of such historic ships as the "Mayflower," "Santa Maria" or "Constitution," or one of the famous clippers of the age of sail, often finds himself up against a dead wall when his blueprints arrive and he attempts to start the job, because of his inability to "read" the drawings. Not that ship drawings are at all hard to understand, but, just as in reading radio diagrams, one must be familiar with the conventions and symbols employed in order to read them without difficulties.

The drawings for the hull of the model ship, known as the lines of the ship, usually consist of three plans. One is the sheer plan, illustrated at the top of the full-page drawing, Fig. 1, the second, is the "half-breadth" plan, shown in the center of the same page, and the third, shown at the bottom, is the "body" plan. The

sheer plan, as may be seen from the drawing, is simply a side view of the hull, and takes its name from the fact that it shows the sheer, or curve of the deck and hull lines from stem to stern. The sheer line is the line indicating the curve of the deck, and is shown, in Fig. 2, applied to a hull of the clipper type. The lines marked A, B, C and D on the sheer plan are the water lines. This may seem confusing to the beginner, who has understood that there is only one water line on a ship. This is true; there is only one real water line on the ship, and this is usually designated on the plans as "load water line," abbreviated to L. W. L., indicating the depth to which the hull sinks into the water when loaded. The other lines are simply called water lines for convenience, since they represent the same kind of section of the hull as the L. W. L. does. Suppose we took a block model of a hull, set it up in the vise, and sawed it straight through along the line A on the sheer plan. A plan view of the section sawed off would then have the



shape shown by line A in the half-breadth plan, and if another section were sawed off along line B, the shape of the upper side of the section would be the same as shown by the line B in the half-breadth plan, while the shape of the underside would, of course, have the form of line A. This is the principle upon which the bread-and-butter

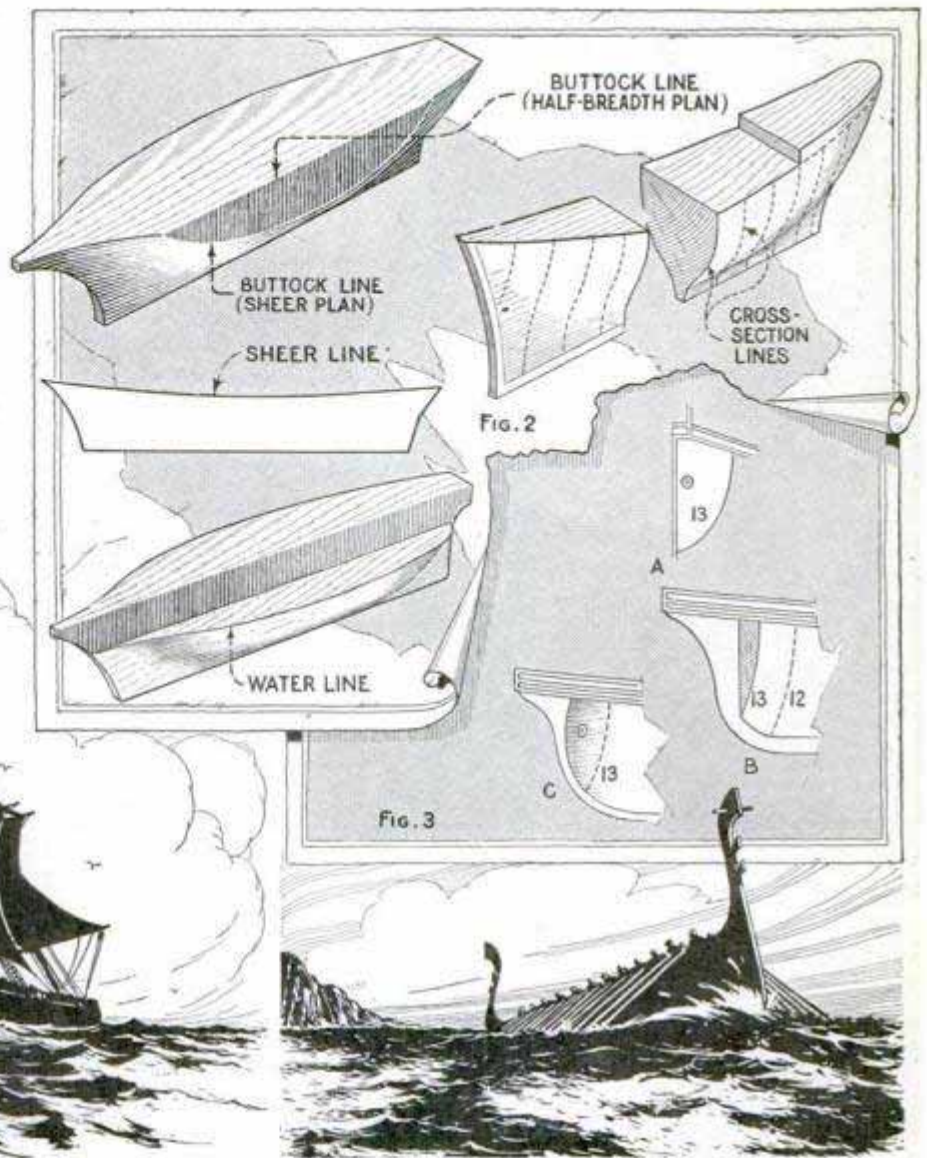
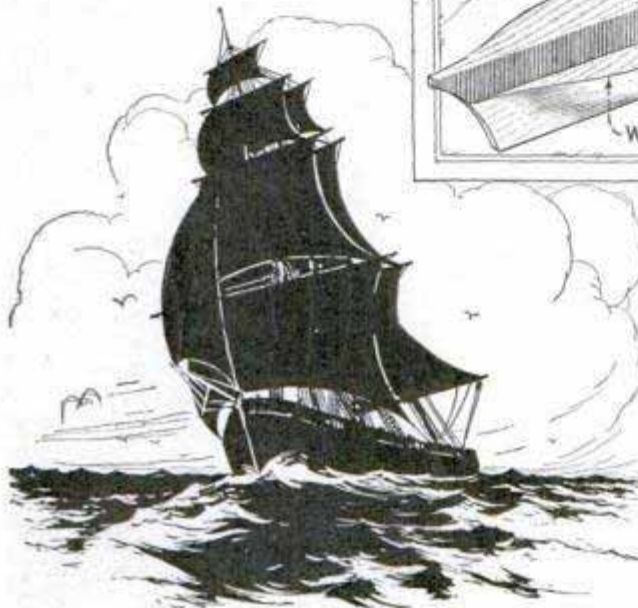


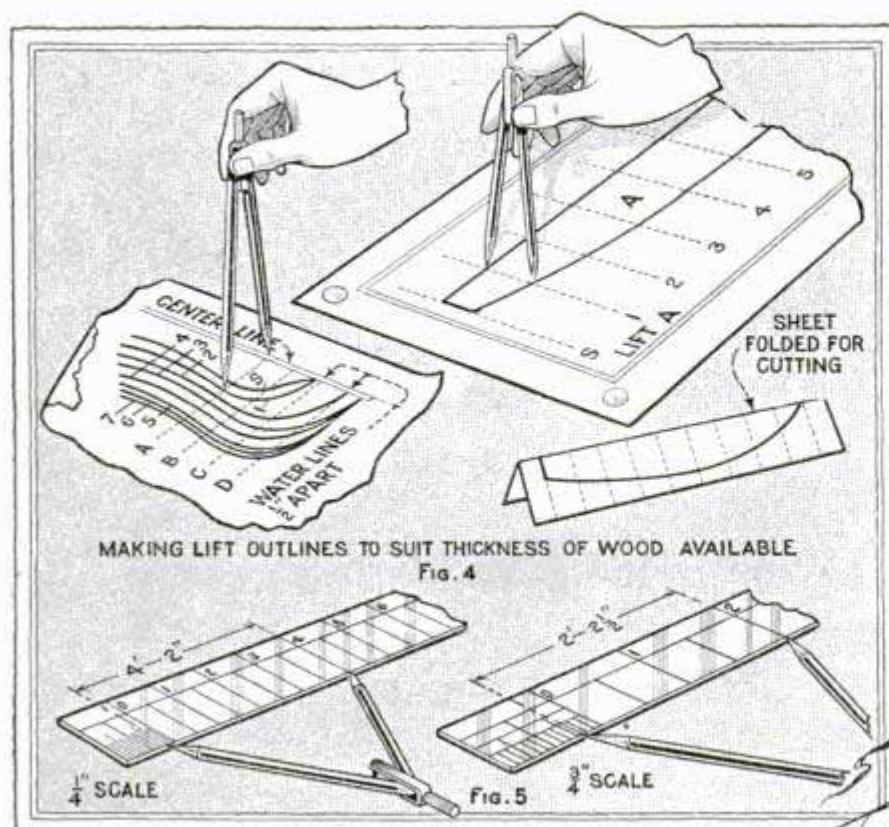
Fig. 2, What the Various Lines of a Ship Drawing Mean Shown by Means of a Block Model; Fig. 3, How to Interpret the Bow Lines

method of making the hull of the model "Half Moon," described in the October, 1926, number of the magazine, is based.

The half-breadth plan looks rather difficult to understand, at first sight, but it is not really so. This is a view of the ship looking down on it from above, but, in order to save making two drawings, the designer makes two in one. The plan below the center line represents a plan view of the deck, showing the arrangement of the deck fittings, such as the ship's boat, deck houses, companion ladders, masts, life rails, etc., as well as the length of the fore-castle and poop decks, and is just as the ship would appear if you looked directly down on it. The upper part of the drawing shows the shape of the sections that would be produced by sawing as described previously, and this, too, is illustrated, somewhat more graphically, in the lowest

drawing in Fig. 2. Here a vertical saw cut has been made along the center line of the block model, down to a water line, and then the block is cut horizontally along the water line and the section removed. The line marked "water line" represents one of the curved lines shown in the upper half of the half-breadth plan. A little study will make this clear.

You will notice a number of dotted lines running fore and aft on the half-breadth plan, and a similar number of curved full lines on the side of the hull as shown in the sheer plan. These are buttock lines, and represent sections also shown graphically in Fig. 2. When a slice is cut vertically off the block near one side, the line of the cut on the deck is straight, while the line on the side is curved. These lines are of more importance to the designer than the model builder, but they do serve

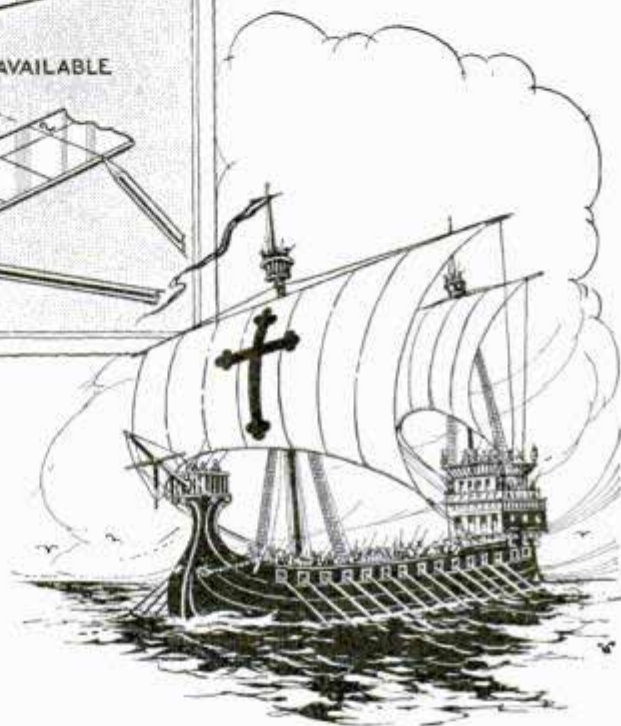


That is, the left-hand half of the body plan, in Fig. 1, shows the cross sections of the ship as viewed from the stern, while the right-hand half shows the cross-section lines as viewed from the bow. This can be understood by comparing the numbers of the lines on the body plan with those on

How to Take Off the Lines of a Blueprint to Suit Different Thicknesses of Lifts; Below, Homemade Scales and Their Use

to point a warning, and that is, that, no matter from what angle the hull is viewed, when completed, all the curves should be "fair," as the designer calls them, that is, they should have a smooth, clean sweep from one end to the other, with no humps or hollows in them.

When we take a loaf of bread and slice it, we produce exactly the effect of the lines in the body plan. The lines in this plan represent cross sections of the body as they would appear if the block were cut straight across at regular intervals along its length. Note the upper right-hand drawing in Fig. 2. These lines are very important for the modeler, since from them he cuts the templates that enable him to give his hull the correct shape. The cross sections are taken, as stated, at regular intervals along the hull; these are called the stations, and are numbered from 1 to 13 in Fig. 1. The stations are similarly marked on both sheer and half-breadth plans. The designer does another thing with the body plan that puzzles the beginner. In order to show all the cross sections on one plan without confusion, what he does, in effect, is the same as if he had split his hull in two down the center and then turned one half end for end.



the sheer plan. Line No. 1 on the body plan is a cross section of the hull at station 1 on the sheer plan, and line No. 13 on the body plan is a section at station 13 on the sheer plan.

There is one thing to bear in mind in connection with the last-mentioned line, No. 13, and that is, that the bow curves forward to the stem from this line. This may seem apparent, and it is easily seen from the sheer and half-breadth plans, but I have seen model makers very puzzled over this. Line 13 is shown at A in Fig. 3, and the model makers referred to were carving the hull as though the side were cut straight in at this point, as indicated at B. The proper shape, of course, is shown at C.

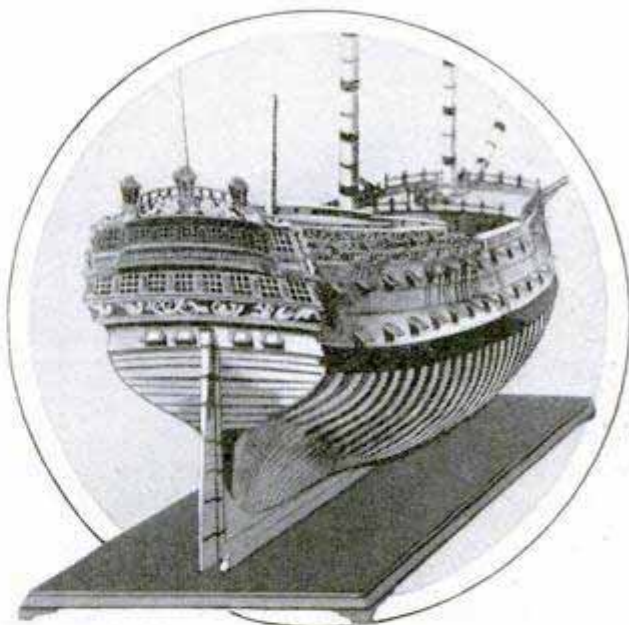
Where the blueprints or drawings are made to such a scale that they are the full size of the proposed model, their use is simple. All one has to do is to trace the

water lines on the half-breadth plan on heavy wrapping paper and cut out the templates for making the lifts, as described in the article on the "Half Moon" previously mentioned. Care must be taken to make the wood used for the lifts the same thickness as the distance between the water lines. If working from a small drawing, as in a magazine or book, the lines of the hull can usually be enlarged without much trouble also. For example, the drawings of the "Santa Maria," given here, show a hull $4\frac{3}{8}$ in. over all. If this is enlarged twice, it will make a model $8\frac{3}{4}$ in. long, which would be suitable for a small space; enlarged three times it would be $13\frac{1}{8}$ in. long, which is a very nice size for a larger model. The procedure of enlarging is simple. Draw a center line on a sheet of paper, measure the distance from station to station with a pair of dividers, then, starting at station 1, step off this distance twice with the dividers and make this point station 2. Do the same all along the line for the other stations. At these points erect perpendiculars to the center lines, then take off, on the original half-breadth plan, the distance from the center line to the point where the first water line crosses station line No. 1. Step this off twice on the new plan, then do the same with stations 2, 3, and so on. This will give a series of marks through which the new water line can be drawn. The same method is used for making all the drawings, taking the measurement on the original with the dividers and stepping it off twice on the new plan. If the design is to be enlarged three times, step all the dimensions off accordingly.

Occasionally the distance between the water lines on the blueprints is an odd fraction, like $\frac{7}{16}$ in., and no lumber this thickness can be obtained for the lifts, or the modeler may want to use wood of a different thickness, which he has on hand. Suppose we have wood $\frac{1}{2}$ in. thick we want to use, and that the distance between the water lines on the drawing is some other measurement. To make new water lines for the lift templates is easy. Take the body plan, and, starting at the top water line, draw new lines on the print $\frac{1}{2}$ in. apart, taking care to keep them at right angles to the vertical center line. (See Fig. 4.) Now draw a center line on the piece

of paper to be used as a template, and draw the station lines at right angles to this. Number them as on the blueprint. To make a new water line A, take off with the dividers the distance from the center line to the point where the cross-section line of the stern, marked S, crosses line A, and transfer this measurement to the template. Then, still on line A, take off the measurement of cross section 1 and transfer this to the template at station 1. This is shown in Fig. 4. Still keeping on line A, transfer all the cross-section points to the corresponding station marks on the template, then draw, through the marks, the new water line. This need only be done on one side of the center line on the template, as, if the template is folded along the center line and cut on the line as indicated, both sides will be alike.

Where the scale of the original is unsuitable, and the model is to be made to a different scale, it is well to have a set of paper scales, which can be obtained from drafting-supply houses. In the absence of these, the model builder can make his own. Suppose the original scale is $\frac{1}{4}$ in. to the foot, and the model is to be made to $\frac{3}{4}$ -in. scale. Make two scales from pieces of bristol board, about 12 in. long and $\frac{3}{4}$ in. wide. Graduate one of them every $\frac{1}{4}$ in.



Built-Up Model of English Man-of-War "Valiant"; Ribs Shown Correspond to Cross-Section Lines

and the other every $\frac{3}{4}$ in., as shown in Fig. 5. Make the first graduation from the left-hand end of the scale zero, and the remainder 1, 2, 3, etc. Every graduation will then represent 1 ft. Divide the

space to the left of the zero mark into twelve equal spaces, which will each represent 1 in. Marks for the half inches should be omitted, as this fraction can easily be estimated, and the marks will only make the scale hard to read. Now, the dimensions of the original drawing are read on the $\frac{1}{4}$ -in. scale, and those of the new model laid out with the $\frac{3}{4}$ -in. one.

Slotted Sawhorse Saves Time

A carpenter engaged in repair work away from the shop found himself inconvenienced at times by his inability to hold small boards or pieces for ripping or cross-sawing. The difficulty was at length overcome by sawing a wide slot through the top member of a sawhorse, vertically in the center. The slot received the saw and allowed the smallest pieces to be held firmly upon the horse while cutting or trimming. It also kept the saw in a position most convenient for intermittent usage.

Removing Effects of Fire with Chemicals

Not long ago our telephone bell rang and the following question was asked: "Can you tell us how to get the smoke odor out of our house? We had a little fire a couple of nights ago and the house was all filled with smoke. We have had all the windows and doors open since then, but it still makes us almost sick to come into the house." We replied that we would be around in about an hour and see what could be done. We armed ourselves with three large beakers, a supply of potassium permanganate and hydrochloric acid and proceeded to the house. We found that a bed had caught fire in some way and that the covers, mattress

and feather pillows had been smoldering for some time before it was discovered. The whole house had been filled with an intensely disagreeable odor and everything was coated with a dark deposit. The house had five rooms on one floor, opening into each other. We removed all the delicate textile materials as well as those which were dyed with bright colors. All exposed metal parts, such as nicked plumbing fixtures, etc., were then rubbed with a cloth, well moistened with paraffin oil, in order to protect them. The windows and outside doors were all closed, and after placing the granite beakers

For the Model Shipbuilder

OF all the vessels built in the golden age of sail, none has so typified the great qualities of the clipper ship as Donald McKay's masterpiece, the "Flying Cloud." She was the fastest vessel on long voyages that ever sailed under the American flag. On her maiden voyage, in the summer of 1851, the "Flying Cloud" made a day's run of 374 miles, logged 1,256 miles in four consecutive days, and made San Francisco, around Cape Horn, in eighty-nine days from New York.

The many readers who have successfully built the model of the "Half Moon," and have asked us to tell them how to build a model of another famous ship, will be glad to know that in a coming issue they will learn how to make one of the "Flying Cloud."

about the rooms we poured the hydrochloric acid over the potassium permanganate in the beakers and left the chlorine, thus generated, to do its work. The beakers were set on newspapers as the contents splattered somewhat. In a couple of hours we returned and opened all the doors and windows, and after airing the house for about an hour, we went in to note the results. The odor was almost entirely gone. In order to get rid of it completely we sprayed the rooms quite freely with a mixture of one part of eucalyptus oil to nine

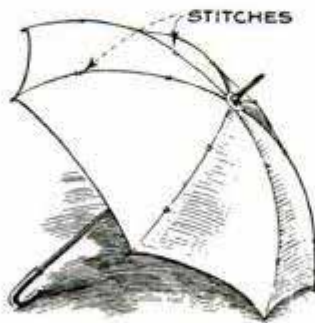
parts of paraffin oil. In a short while the owners returned and were delighted with the results. They slept in their home that night. Much to our surprise the shades, which had been a grayish tan in color when new, but which had been blackened by the smoke, had changed back to their original appearance by the treatment.

Some of the water used by the firemen, in extinguishing the fire got on the furniture and made white spots. We speedily removed these with methyl alcohol. By this time our employer was sold on chemistry. He had some fine new oak

floors, which were as black as the rest of the house. He was told that resanding and refinishing were necessary, which was expensive for five rooms. We offered to try to remove this deposit and our offer was accepted. The floors had been varnished and waxed and the varnish was not yet worn off. We prepared some Javelle water and, using this diluted with an equal volume of hot water, applied it to the floor with a rag. The deposit disappeared almost as soon as the rag touched it, leaving the floor just as clean as when it was first finished. Several people who were present showed a great interest in this preparation. The information that it was Javelle water meant nothing to them, notwithstanding the fact that most cans in which bleaching powder is sold have the directions for its preparation on them. Small portions of the floor were treated at a time and were thoroughly washed off at once with plenty of fresh water. The varnish was partly removed in some places but nowhere did it come off completely. The mopboards were all given a light coat of paraffin oil in order to protect them against the action of the Javelle water. After the floors were dried they were given a coat of shellac, as varnish would not have dried well due to the wax, which was not entirely removed, and then it was waxed again. This completed the chemist's job. The paperhangers, painters and professional cleaners performed what remained to be done.—A. T. B., Ottawa, Kans.

To Increase Life of Umbrella

Umbrella ribs or spokes are usually broken when the stitches that hold them to the cover come loose. To prevent this trouble and to double the life of an umbrella it is a good idea to sew some more stitches around the ribs with strong thread as shown in the illustration. This should be done as soon as the umbrella is purchased.—J. P. Bowles, New York City.



Rubber Feet for Camera Tripod

When camera tripods are used on wooden or tile floors, they will have a tendency to slip. If, accidentally, the tripod falls, the camera may be ruined. You can prevent this by providing the tripod with rubber feet. Go to the neighboring drug store, ask for three rubber crutch tips, which come in assorted sizes, and slip them over the ends of the tripod legs.—G. S. Tompkins, Monroe City, Mo.



Removing Glass Stoppers from Bottles

Sometimes glass stoppers in bottles fit so tightly that they cannot be removed.



Tapping is liable to break them unless it is done in the following way: Press the thumb of the left hand against the stopper, as

shown in the illustration, and then tap on the opposite side with a small wooden mallet or a piece of wood. Do not use a piece of metal or stone to do the tapping.—R. Bohn, Bakersfield, Calif.

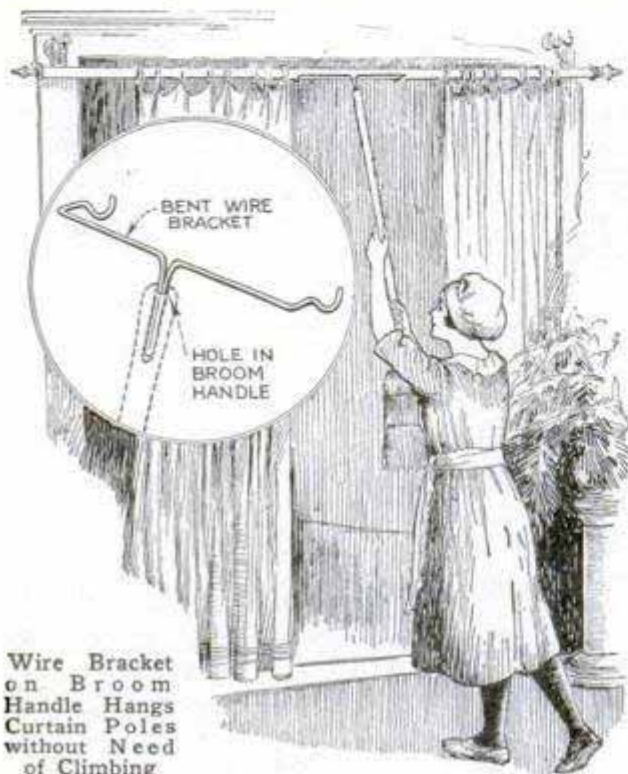
Anti-Knock Compound Saves Gasoline

An anti-knock compound for low-test gas that is cheap to make, is a real gasoline saver, adds a noticeable amount of power and leaves little carbon, is composed of 70 per cent benzol and 30 per cent aniline oil, to which is added three moth balls. I have tested this out in two cars under varying conditions, and the results are as stated. One pint of the mixture is added to 10 gal. of gasoline.—Philip C. Shera, Columbus, Ohio.

1394 Northwest Blvd.
Grandview Heights

Detachable Bracket on Broom Handle Hangs High Curtains

To avoid the dangers of climbing onto chairs and other pieces of furniture to remove or replace curtain rods, one house-



Wire Bracket on Broom Handle Hangs Curtain Poles without Need of Climbing

wife devised a very simple tool which can be quickly attached to the handle of the broom. A length of heavy-gauge wire is bent in the shape shown in the illustration, and a small hole is drilled to a depth of 3 in. in the end of the broom handle to receive it. The hooks of this device may be made to engage and support the curtain rod in a horizontal position while the curtain is being raised or lowered. When not in use, the attachment may be instantly removed from the broom and stored in the broom closet.—G. E. Hendrickson, Argyle, Wis.

Grading Lawns

The home owner should first examine the kind of soil he intends to use for grading so that he will know about how much it will settle. After clay is dug up and loosened, its bulk is increased about 25 per cent and it will then settle gradually about 20 per cent in height and 16 per cent in bulk within a comparatively short time. This must always be taken into consideration, and a grade should

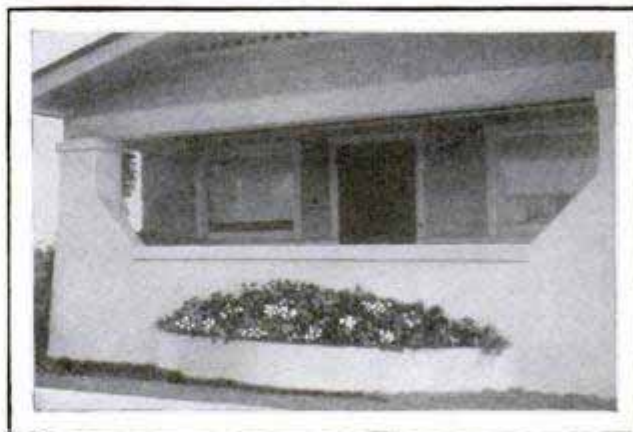
never be run to the exact level where it is desired but it should be run over this level. Should you find a great deal of sand, it is well to know that this increases 8 per cent in bulk when dug and settles 25 per cent in height.—L. H. Georger, Buffalo, N. Y.

Black Paint for Tires

Oil paints deteriorate rubber and should not be used for blackening tires. However, a good tire paint which will preserve the rubber and give the tire an attractive dull-black appearance can be made as follows: To 2 oz. of flake graphite add 2 oz. of ordinary lampblack; mix thoroughly and add $\frac{1}{4}$ pt. of shellac. This mixture can be thinned to the proper consistency with denatured alcohol. It will adhere readily to the rubber and is flexible and tough, so that it will not crack.—H. A. Rogers, Springfield, Ohio.

Unusual Flower Bed

The photo shows an unusual flower bed with which a Los Angeles builder has ornamented the front of his house. It is built onto the side of the porch wall as a sort of baylike extension, semicircular in design. It is about 10 ft. long, its maximum width is 2 ft. and the height of the curved wall is 14 in. Both the porch wall and the flower container are constructed of brick and finished with white cement stucco. Filled with earth to within 2 or 3 in. of the top, it contains a



Novel Semicircular Flower Bed Built as an Extension from the Side of the Porch

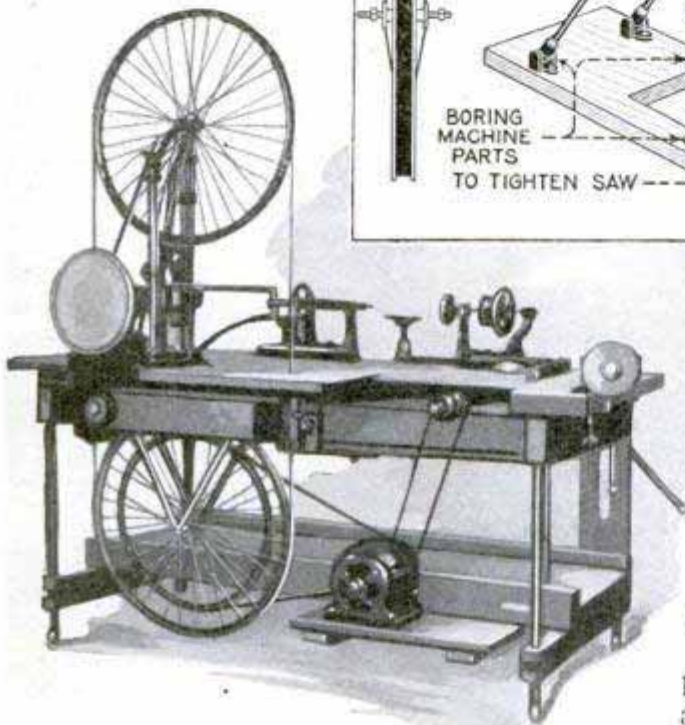
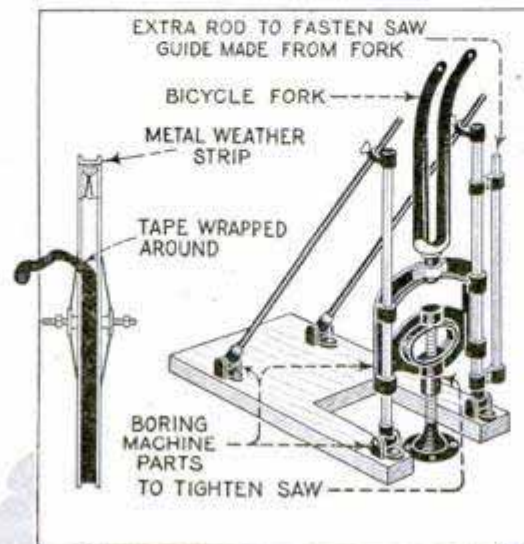
charming planting of begonias and asparagus sprengeri.—Charles Alma Byers, Los Angeles, Calif.

Homemade Bandsaw

If the amateur woodworker does not feel justified in purchasing a manufactured bandsaw, he will find a homemade one, of the type shown in the photo and illustra-

The wheels are held by means of bicycle forks. A $\frac{1}{4}$ -hp. electric motor, belted to the lower wheel, runs the device. Each wheel is wound with a layer of friction tape to prevent the saw blade from slipping. To loosen and tighten the top wheel,

Homemade Bandsaw for the Amateur Woodworker Costs Little and Is Practical for Large Work; It Is Run by a $\frac{1}{4}$ -Hp. Electric Motor, Which Is Also Used to Run a Circular Saw, an Emery Wheel and a Wood Lathe



tion, entirely practical and sufficiently large for all the work he may wish to do. It consists of two bicycle wheels, mounted above and below the bench as indicated.

parts of an old boring machine are used, and the fork is mounted on these. A saw guide is also provided. It is possible to use the same motor for running a circular saw, emery wheel and small wood lathe, all mounted on the same bench.—C. F. Wilhelm, Kitchener, Can.

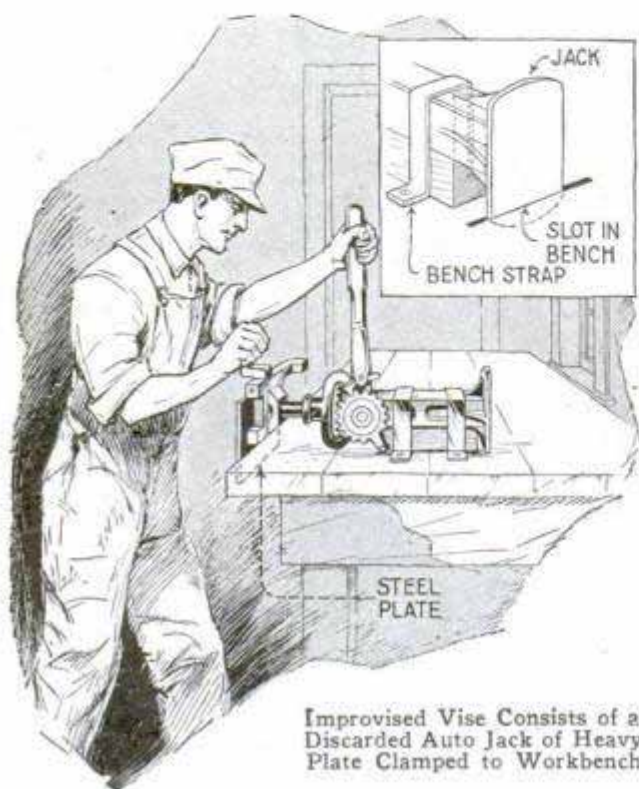
Air Leaks in the Water-Pressure Tank

The pressure in a tank belonging to a house-pumping system is maintained by air pressure applied to the water. If the air escapes, the water will not flow through the pipes, and if the water pressure goes down while no water is being drawn off it means that the air leaks out at some joint. Leaks usually occur above the water line and between two riveted plates. To locate them, apply a strong solution of soap and water to the differ-

ent joints and connections of the tank with a brush. Any leak will show in the form of bubbles. If it is a small leak at a seam or rivet head, take a cold chisel and hammer and tap the plate edge or the edge of the rivet head directly above the leak until the two metal sections are forced together. If this method fails, it will be necessary to call in a boiler worker or competent plumber. If the leak occurs at a fitting, a slight turning up with a wrench may remedy the trouble.—L. B. Robbins, Harwich, Mass.

Workbench Vise Made from Auto Jack

A good vise for the workbench can be made from a spare auto jack at practically no expense. Bolt a heavy piece of steel



Improved Vise Consists of a Discarded Auto Jack of Heavy Plate Clamped to Workbench

plate to the front of the bench to project above the top several inches. Clamp the jack to the bench top, as indicated, so that the top end of the jack will be opposite the top of the steel plate. This is accomplished by spiking or bolting a block of wood to the bench to support the jack properly. If necessary, cut a slot in the bench top for the end of the foot of the jack to rest in. Fasten the jack to the bench by means of two flat-iron clamps. These should be just the right length to hold the jack to the bench securely, when the bolts are driven down. By pumping on the handle, the head of the jack can be moved backward or forward. A screw-motion jack will be found most satisfactory for this purpose.

Easy Way to Empty the Range Boiler

Emptying the range boiler is usually a difficult task for the amateur plumber. The hot-water pipe unions must often be broken to let air into the top of the tank. This is itself hard to do and the joint usually "weeps" when it is made up again. My tank had a standard com-

pression cock with a smooth nose. In the washing-machine equipment, there was a short piece of hose with a clamp and a male hose-coupling thread. This was slipped on the cock and the hose clamp tightened. A length of garden hose was screwed into this and the other end was connected to the ejector used for emptying the washing machine. The cold-water inlet valve on the boiler was then closed, and the drain cock and a hot-water cock at the kitchen sink were opened. Then I started the ejector in the laundry. Some air began to enter the valve at the kitchen sink and the suction of the ejector was strong enough to drain the water out of the pipe between the sink and the tank. The water held in the section of pipe below the kitchen floor ordinarily prevents air from entering the top of the tank. When this pocketed water had been sucked over into the tank, the water at the ejector was turned off. The water then ran freely from the tank until it reached the level of the discharge of the ejector. Then I started the ejector again and soon had the tank empty.—L. B. Robbins, Harwich, Mass.

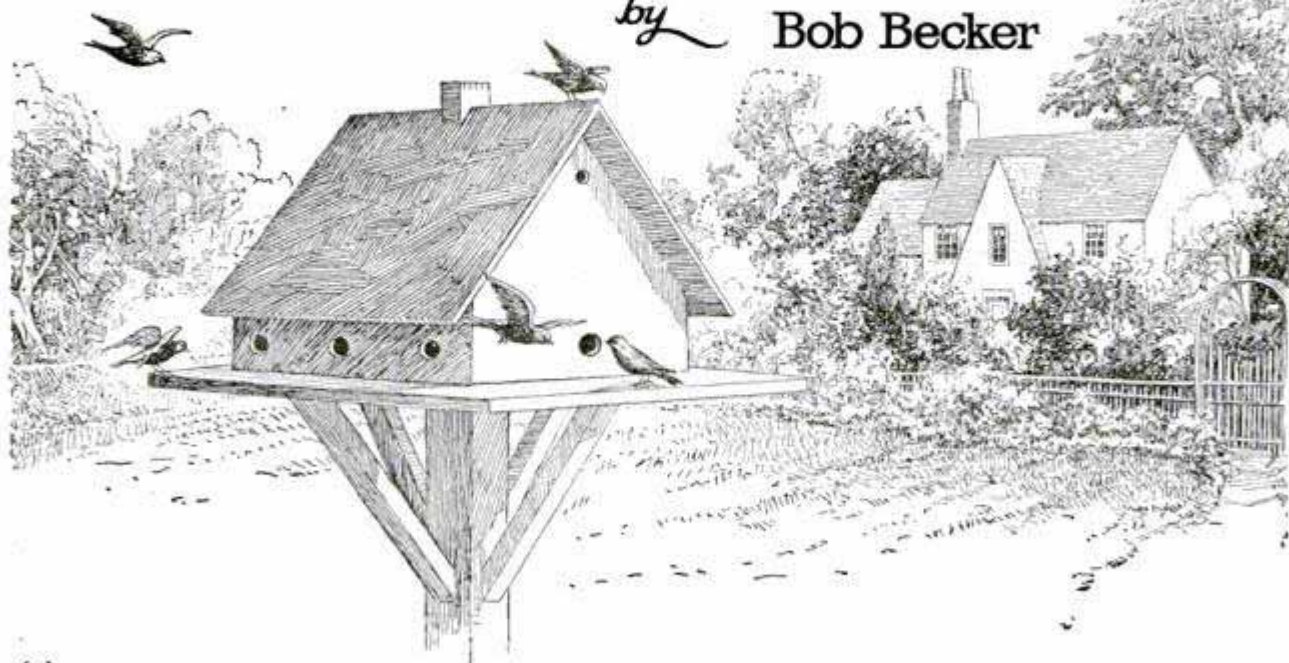
Flytrap Made from a Flowerpot

An excellent flytrap may be made from an old flowerpot, a glass and an ordinary saucer. The pot is inverted and raised on three small blocks of wood. The glass is placed over the hole in the bottom of the pot, and a saucer, with a little sugar in it to attract the flies, is set underneath. The flies enter the space at the bottom of the pot to reach the sweet bait, and when satisfied, they fly to the top through the hole in the pot and into the inverted glass. The flies may be removed by placing a card between the two receptacles and then immersing the glass in water.



BIRD HOUSES FOR YOUR GARDEN

by Bob Becker



(1)

PRACTICALLY every home owner likes to have song birds nest around his house, as the peppery little wrens, robins, bluebirds, woodpeckers and other common species not only appeal strongly to one's interest and affection, but are a distinct economic asset, since they feed on noxious insects and on the seeds of plants that are anything but welcome in the garden.

If you want to attract these feathered friends to your home it is easy to do so by providing nesting boxes for them, and you can make these at home for almost nothing. With no more than a saw, hammer, nails, some scrap lumber and a can of paint, any home mechanic can make a wide variety of bird boxes of pleasing design that will not only look good to the songsters, but will also add a delightful touch to the garden.

The first question that comes up is: What size shall we make the bird homes? Different varieties have different tastes in nests, and the boxes must be suited to the birds for which they are intended, or else the invited guests will not use them. For example, a martin house, as shown in Fig. 1, should have over-all dimensions, on the floor space, of 18 by 18 in., divided into 6 by 6-in. compartments, as shown in Fig. 11. The compartments should be 6 in. deep also, and the entrance holes $2\frac{1}{2}$

in. in diameter and placed about 1 in. above the floor.

For the average bird box, wood is by far the best material; metal is not good, because it conducts heat easily, and the nests become too hot. Use an easily worked wood, like pine or cypress, the latter being the better because it resists decay so well. However, successful bird houses can be constructed from almost anything in the shape of wood: Rough slabs of sawmill waste, such as is sold for kindling, thin lumber from a packing box; in fact, any kind of wood that will make a rainproof shelter and not be so thin as to go to pieces easily, or make the nest too warm.

Of all the birds we have secured as tenants of our garden apartments we like the house wrens best. They are regular little alarm clocks, always full of life, and they "sing their heads off" from morning till night. Wrens are the least fastidious of nesting birds; anything from an old shoe to a tin can suits them, but they do appreciate a house built especially for them. The ideal wren house has a floor space 4 by 4 in., 6 to 8 in. deep, with the entrance from 1 to 5 in. above the floor. Up to a few years ago, the standard specifications for a wren-house entrance called for a round hole the size of a quarter ($1\frac{1}{4}$ in.), and this seemed to suit the birds



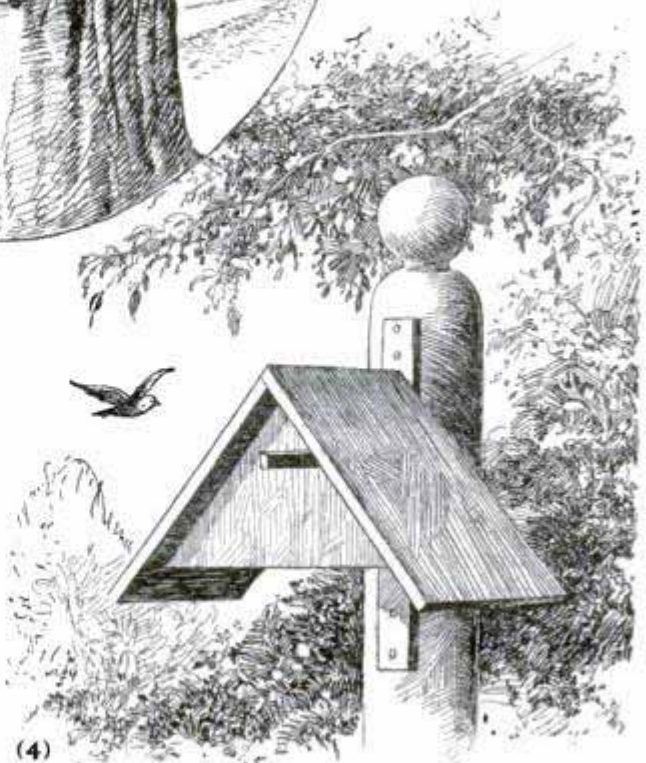
very well. Now, however, the bird lover has taken into consideration the wren's habit of carrying into its box short sticks for the nest, and he specifies that the entrance shall be a horizontal slot, 3 in. long and as wide as a quarter. This enables the nest builder to get its sticks into the box without much trouble. This type of entrance is shown in the house in Fig. 4. In Figs. 2 and 3 are shown two other types of wren houses that can be adapted to other birds by simply changing the dimensions. The log-cabin type, in Fig. 2, is most easily built by using dowel sticks, $\frac{3}{4}$ in. in diameter, notching the corners as in regular log-cabin construction and either chinking the joints between the logs or lining the inside of the house with thin wallboard for warmth. The "logs" should be stained

a dark brown. The dimensions for this house are: ends 5 in. wide and 8 in. high, sides 8 to 10 in. long, and roof and floor to fit. Be sure to allow the roof to project in front and rear to keep the rain out, and waterproof the joint of the roof boards with a strip of roofing paper, tacked over it.

The type shown in Fig. 3 is a very attractive one, and is made very simply, using a piece of pine for the back and sawmill-waste slabs for the front, sides and roof. Proportion the box as specified before. The house in Fig. 4 is also

very simple to make, either from plain boards or from rough slabs. Make the floor 10 in. long and 4 or 5 in. wide. The sloping sides of the box are 10 in. long.

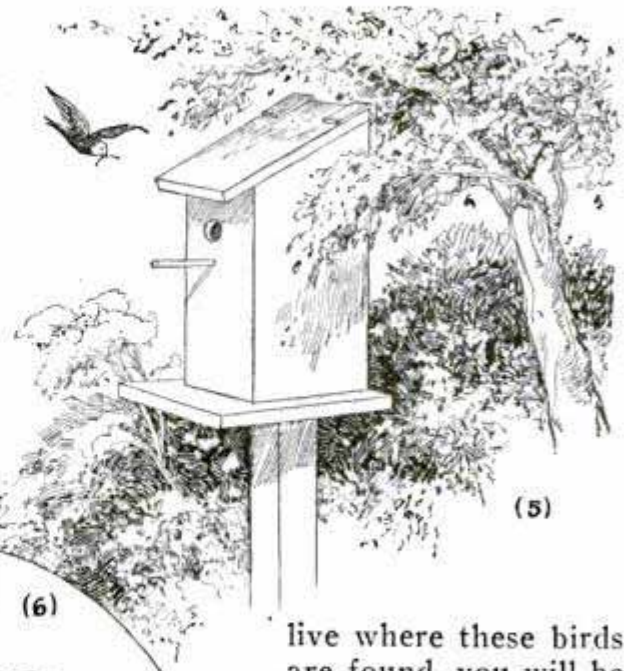
All our wren houses are fastened about 7 ft. above ground, on the garage, the house and on trees. Under no circumstances



should a wren house be placed more than 9 or 10 ft. above the ground.

Attractive wren houses can be made from gourds, and all you have to do with them is to bore a $\frac{7}{8}$ -in. hole through the side, tie a string around them, and hang them up. Although metal nesting boxes are not recommended, a tomato can will make a wren nest in the absence of anything better. Cut off the top and, with the pliers, bend in the rough edge so that it will not injure the bird. Punch a couple of holes through the lower side at the "entrance" so that a twig for the birds to perch on can be wired to the can, two more in the "roof" so the can may be hung to a tree and two in the bottom for good drainage. Then give the can a coat of green paint and hang it up in a shady spot.

The bluebird, a handsome, gentle-voiced songster, is easily attracted to a bird house, so, if you



(5)



(6)

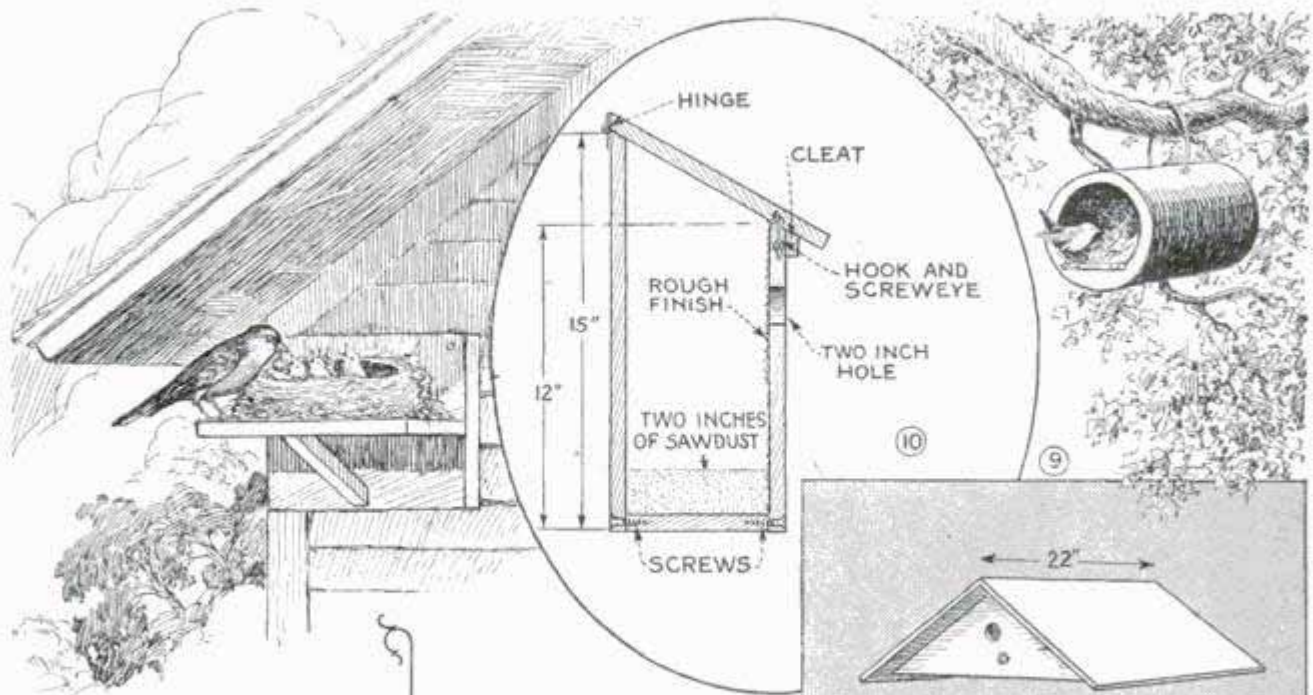
live where these birds are found, you will be well repaid for the trouble of making homes for them. This bird is partial to orchards, and the houses may be placed on the trees, from 5 to 10 ft. above the ground. Be sure to make the boxes with removable tops, so that you can peep into the nests during the mating season and see how the young ones are getting along. Boys and girls find this kind of natural-history lesson great fun.

I have made three kinds of bluebird houses, all of which

have pleased the birds. One was made from ordinary packing-box material, with a hinged top, as shown in Fig. 5, the second from $\frac{1}{2}$ -in. white pine, with a hinged front, as in Fig. 6, so that the young birds could be examined. Both of these were painted green. The third was made from rough slabs with the bark left on, exactly like the wren house in Fig. 2, except that the dimensions were larger. The floor of a bluebird dwelling should be 5 by 5 in., the depth of the cavity 6 in., the height of the entrance from the floor 6 in., and the entrance should be $1\frac{1}{2}$ in. in diameter. I recommend the rustic type because it looks

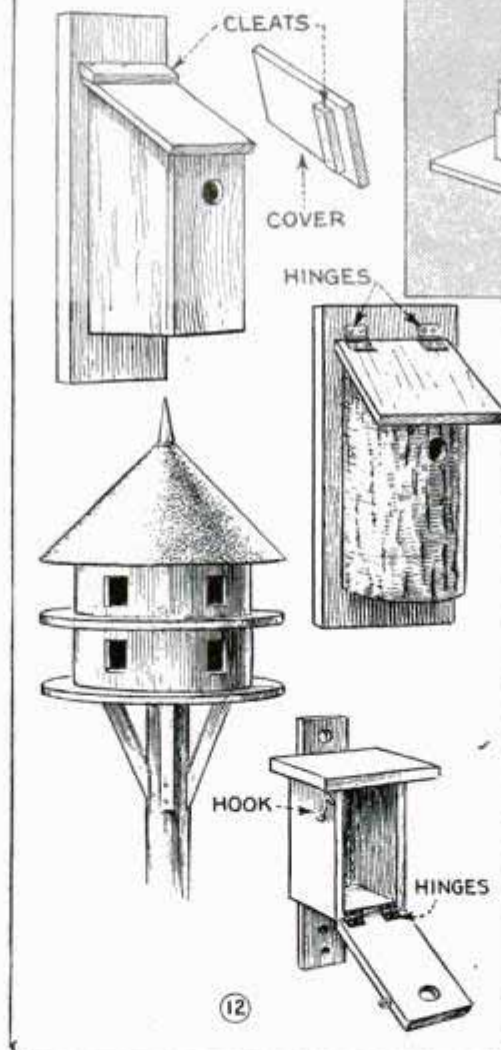
(7)





so well in garden or orchard.

The flicker or yellow-winged woodpecker is another good-looking bird neighbor to have around the yard. If you want to hang up a "for rent" sign for this fellow, make a box as follows: Floor 7 by 7 in., 17 or 18 in. high, and with an entrance hole 2 in. in diameter, about 15 in. above the floor. Better make the top removable, or hinge it, so you can get into the box without any trouble. There must be at least 2 in. of sawdust in the bottom of the box so the birds will have nesting material, and the inside of the front piece of the box should be roughened so that the birds can climb to the entrance. In one flicker house that I constructed, I used for the front board a slab of maple with the bark left on, turning the bark side to the inside. When the house is finished, paint it green (unless it is of the rustic type) and place



it with the long axis vertical in a sunny place, from 9 to 15 ft. above the ground. Details of the construction of a house of this type are given in Fig. 10.

Usually it is unnecessary to make any overtures to the robins, so long as natural nesting places are provided by shrubs and trees. But when these are lacking you can entice the red-breasts by putting out nesting platforms for them. These should be of weathered lumber or of wood with the bark on. I have one of the

latter type at the corner of an open porch under the eaves. A pair of birds grabbed it immediately, so that we had a continual "robin show" through the nesting season, until the young birds graduated and left

the yard. For the shelf, use one backboard, 11 in. wide and 6 or 7 in. high. Then nail on a flat shelf of the same dimensions; nail it to the backboard and brace it as shown in Fig 8. Two heavy nails or screws will fasten it to the house, shed or garage. The same type of shelf will often attract phoebes, as these birds (who are death on insects) like to build a nest on a veranda or under the eaves.

Barn swallows also like shelves, and they are beautiful birds to have around. They have no bad habits, and narrow cleats or small shelves nailed to rafters in a barn or shed is all they require. Sometimes they will occupy a narrow shelf under a porch corner.

Details of construction for the martin house are given in Fig. 11. This should be ready early in the spring so as to attract migrating birds. Once started, colonies of martins usually return season after season, but don't forget to oust the English sparrows, who will want to take possession of the house.

Details of the houses with hinged and removable tops and fronts are shown in Fig. 12, as well as an alternative design for a martin house.

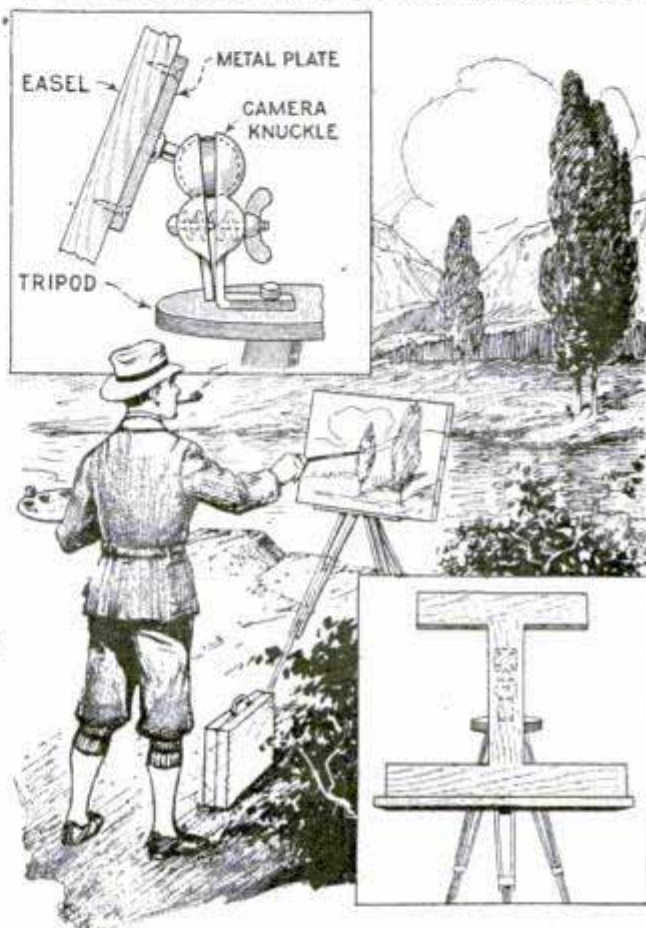
When the houses are finished, there is one general rule to bear in mind in erecting them: Wherever possible let them face the south, thus keeping the entrances away from prevailing winds and storms. Also, fasten them rigidly and securely, as birds prefer houses that do not shake. Hang up some string and some colored yarn in proximity to the houses, and you should have no difficulty in inducing the birds to take possession of their quarters.

Quick Method of Labeling Bottles

An easy and timesaving method of labeling bottles is to use quick-drying, transparent lacquer, obtainable at almost any hardware store. The side of the bottle is given a coat of lacquer with brush or spray gun, the label is firmly pressed on and the face of the label is then lacquered. In a few minutes the lacquer is dry and the bottle ready for use. The labels are not affected by water or other liquids, except alcohols. The method is especially suitable for the photographer because the labels do not wash off.

Adjustable Easel on Camera Tripod

Artists who frequently make outdoor sketches, will find the adjustable easel shown in the drawing of considerable use. A small easel is mounted on a universal joint, such as is used on small pocket cam-



Universal Camera Joint Makes an Adjustable Artist's Easel for Field Work

eras, and the joint is attached to a tripod as indicated, making the whole assembly portable. A metal plate is screwed to the back of the easel and a hole is drilled and tapped to accommodate the screw end of the joint, to permit easy disassembling. This easel can be adjusted to any desired height or angle, and being light, is especially useful for field work.—Guy E. Clark, Everett, Wash.

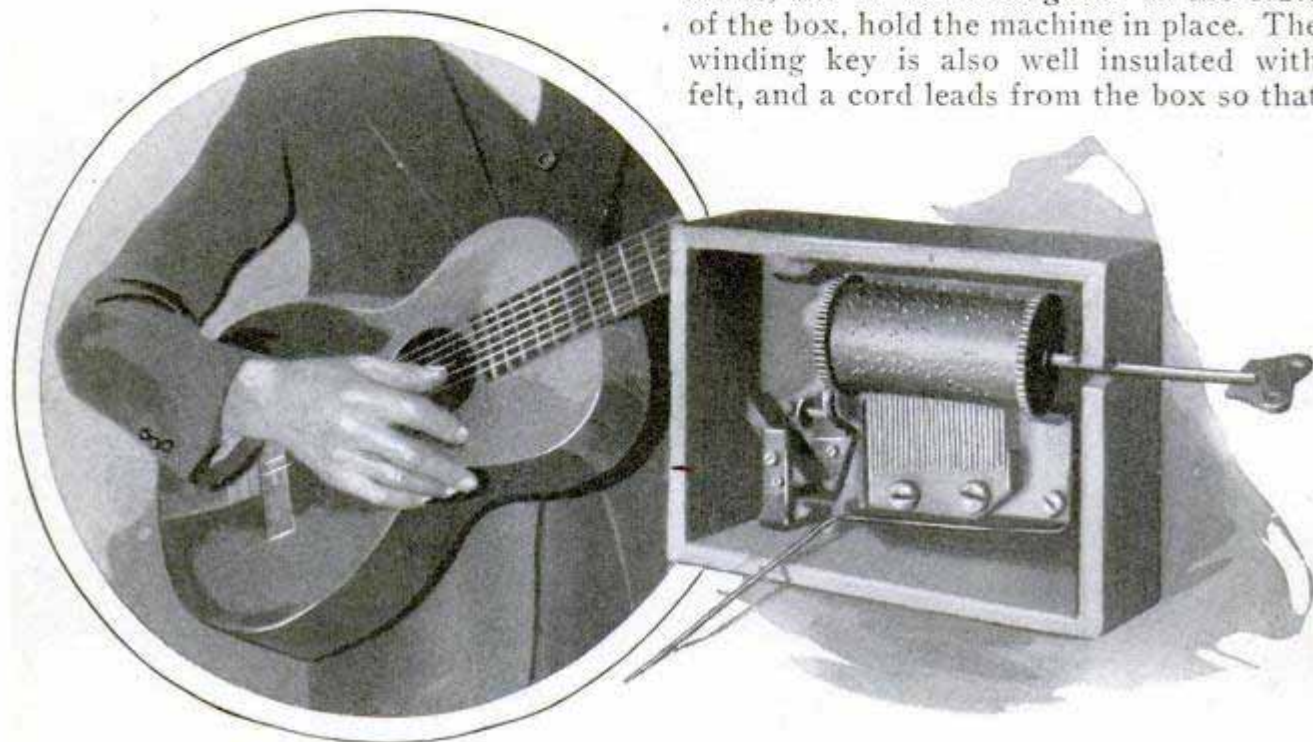
Cement for Metal and Glass

A cement that will hold brass to glass consists of the following ingredients: red ocher, 2 oz.; rosin, 15 oz.; beeswax, 3 oz., and plaster of paris, 1½ oz. I used this cement for holding brass stripping to the glass in an aquarium and found it entirely satisfactory.—Philip C. Shera, Columbus, Ohio.

Mysterious Music Box

By using the device shown in the photo anyone can play a guitar, violin, ukulele or similar instrument by merely holding it in his arms. The music really comes from

fastened inside of a small cigar box so that the winding key projects. A needle, also projecting outside of the box, is soldered to the frame of the machine. Heavy felt is used to line the box wherever the machine is likely to touch the wood, and corks, cut in half and glued to the sides of the box, hold the machine in place. The winding key is also well insulated with felt, and a cord leads from the box so that



Anyone Can Provide Mysterious Music on a Guitar, Violin or Similar Instrument by Means of a Small Music Box Concealed in the Pocket; a Projecting Needle Makes Contact with the Instrument

the instrument but the performer does not have to play it. The secret lies in a small music box kept in the performer's right-hand coat pocket. Such a music box can be purchased for about \$1. It is carefully

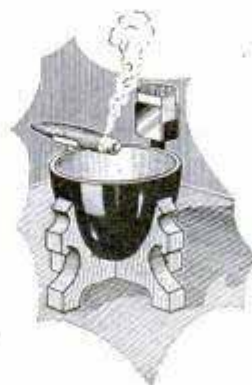
a pull will release the trip, which starts the mechanism. When the box is placed in the performer's pocket, the needle projects outside so that an instrument held against it acts as a resonator.

How to Cut Mica Washers

Did you ever try to cut a mica washer with a knife or a pair of shears? A good method of doing this is as follows: Measure the diameter of the intended washers and select a gouge of which the blade curvature conforms to the circumference of the washers. Lay the sheet of mica on the butt end of a block of hardwood and mark off the circle with a compass. Then use the gouge as a vertical cold chisel, placing the cutting edge over the pencil line and striking the handle a sharp blow with the hammer. Move the chisel around the circle in this manner until the disk is cut out. The inside opening can be cut out in a similar manner with a smaller gouge or, if such a tool is handy,

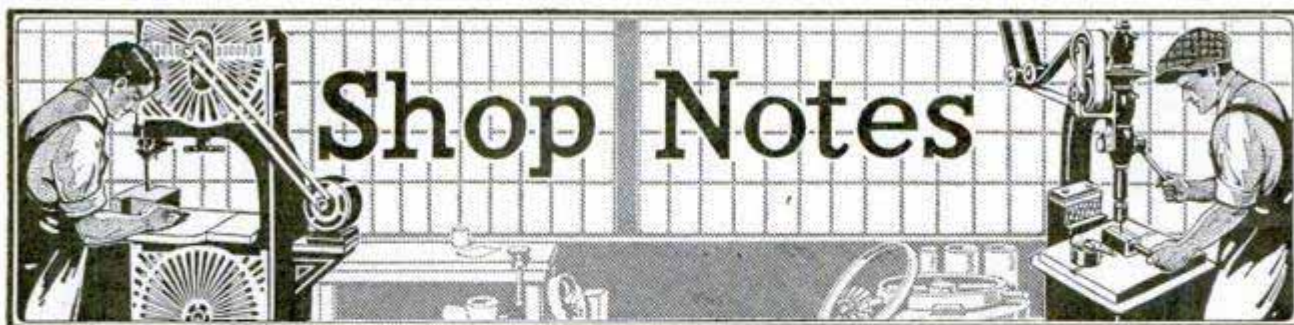
with a belt punch of a suitable size.—L. B. Robbins, Harwich, Mass.

Coconut Ash Receiver



A novel ash receiver can be made from a coconut shell. It is mounted on a small ornamental wooden stand cut out to support it. The long fibers may be allowed to remain on the shell and the rough edge filed down until it is smooth. By applying

a coat of varnish and adding a match-box holder, the tray will be quite attractive.



All Shop Notes published in 1926, in book form—Fifty Cents—from our Book Department

Building-In a Sewing Machine

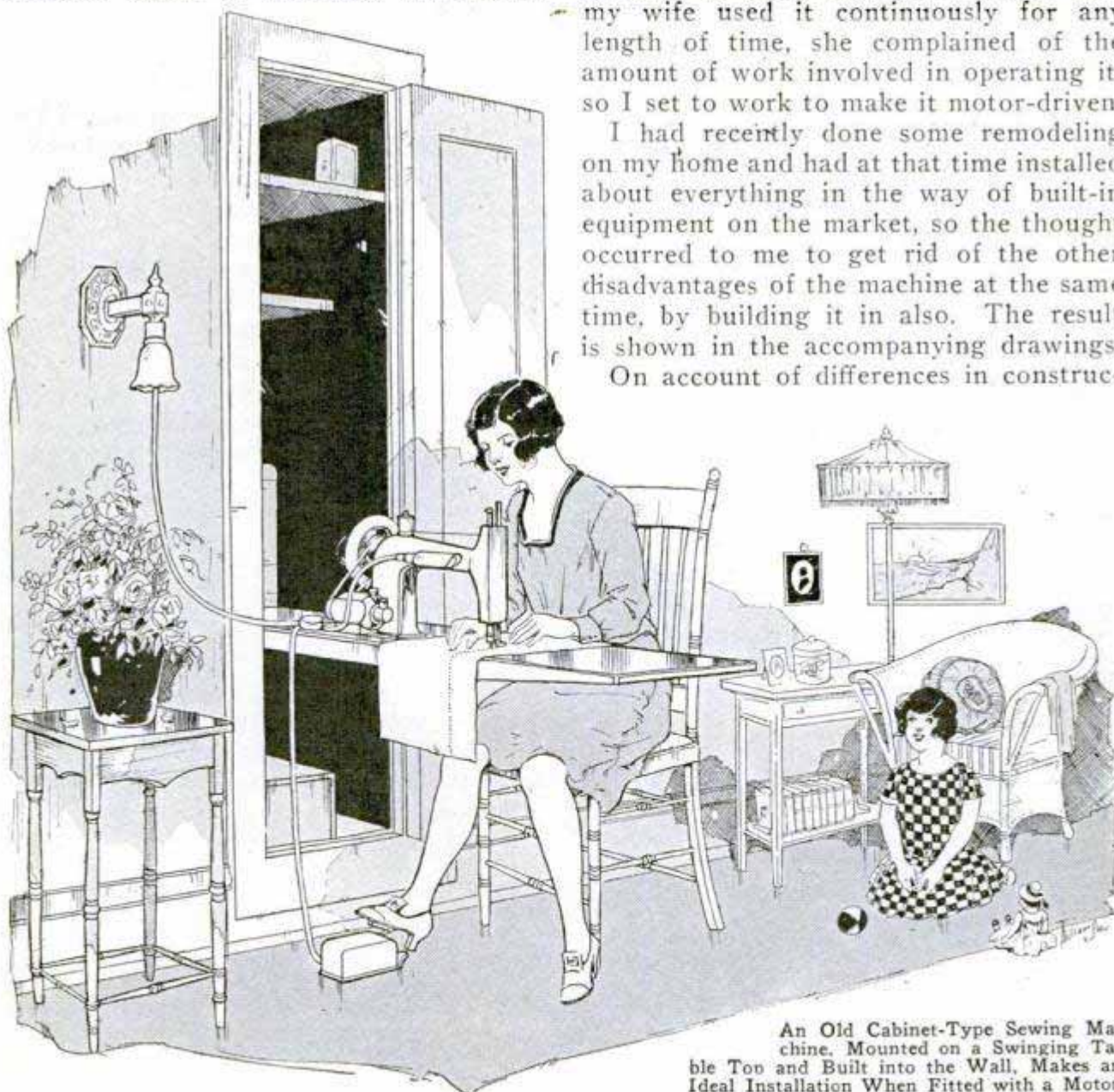
By H. W. ROUTSON

FOR a number of years we had in our home what was considered a very high-grade foot-power cabinet sewing machine. Like all others of this type, however, it

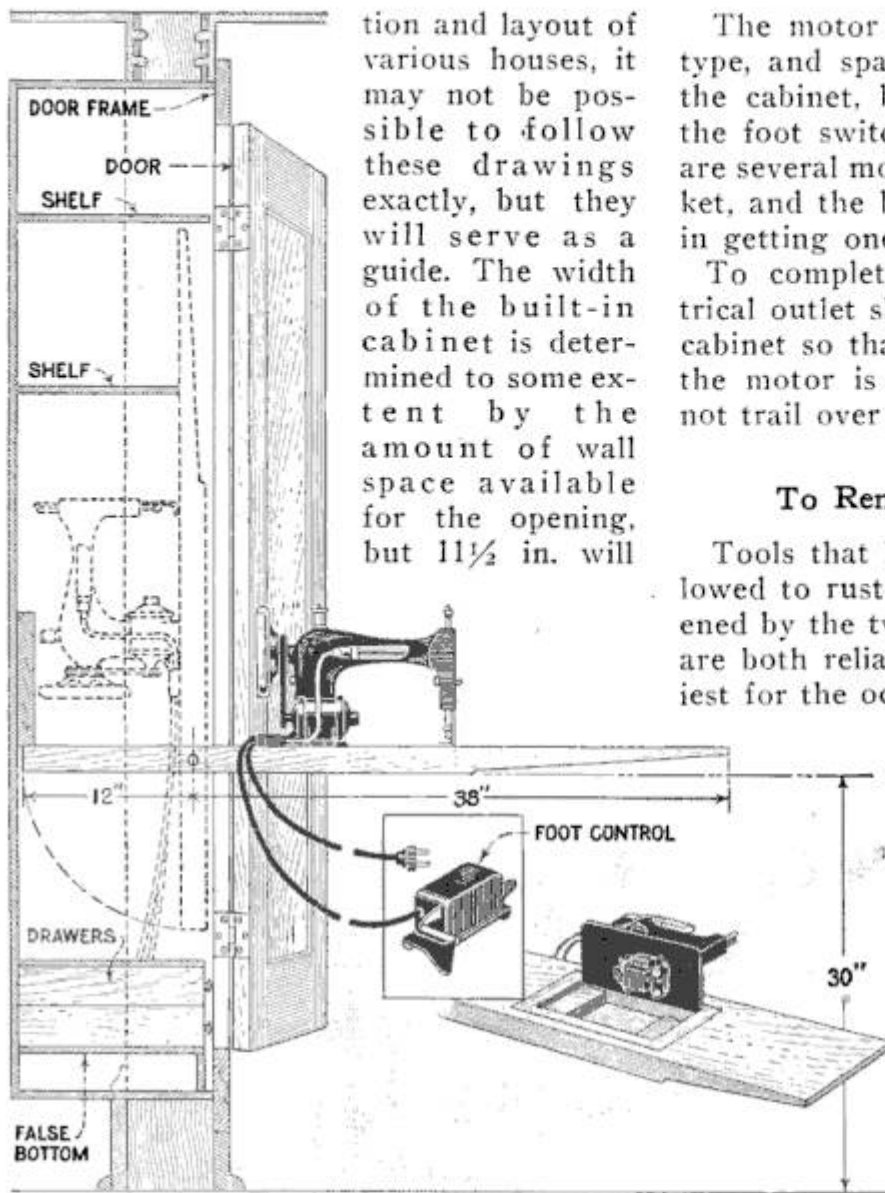
was bulky, hard to move, took up a lot of valuable space and seemed to possess the faculty of always being in the way. In addition to these drawbacks, every time my wife used it continuously for any length of time, she complained of the amount of work involved in operating it, so I set to work to make it motor-driven.

I had recently done some remodeling on my home and had at that time installed about everything in the way of built-in equipment on the market, so the thought occurred to me to get rid of the other disadvantages of the machine at the same time, by building it in also. The result is shown in the accompanying drawings.

On account of differences in construc-



An Old Cabinet-Type Sewing Machine, Mounted on a Swinging Table Top and Built into the Wall, Makes an Ideal Installation When Fitted with a Motor



Cross Section of Cabinet, Showing Arrangement, and Detail of Table Top, Indicating How It Is Recessed for the Motion on the Bottom of the Head

tion and layout of various houses, it may not be possible to follow these drawings exactly, but they will serve as a guide. The width of the built-in cabinet is determined to some extent by the amount of wall space available for the opening, but $11\frac{1}{2}$ in. will

The motor used is of the foot-control type, and space is left in the bottom of the cabinet, beside the drawers, to hold the foot switch when not in use. There are several motors of this type on the market, and the builder will have no trouble in getting one that will suit his machine.

To complete the installation, an electrical outlet should be installed inside the cabinet so that even the flexible cord for the motor is contained inside, and need not trail over the floor to the outlet.

To Remove Rust from Steel

Tools that have been neglected and allowed to rust can be cleaned and brightened by the two following methods; they are both reliable, but whichever is handiest for the occasion should be used. The

first method requires the preparation of a crock or earthenware dish with clean water, in which has been mixed a small quantity of chemically pure sulphuric acid; into this the tools are dropped, after wrapping a piece of zinc about each so that it will make a good contact. Let them remain until the rust has disappeared, then wash well in running water and dry in a warm oven. The acid will

not attack the steel so long as the zinc makes contact with it.

For the second method prepare a solution made from 100 parts of stannic chloride in 1,000 parts of water. Add to this 2 parts of tartaric acid dissolved in another 1,000 parts of water. Then add 20 cubic centimeters of indigo solution mixed in 2,000 parts of water. Clean the tools thoroughly in gasoline, to eliminate all traces of grease and dirt, and then apply the solution to them with a brush. After a few moments, rub the tools briskly with a moist cloth followed by a dry one, and then polish with metal polish if desired, and all rust will be removed. By keeping a lump of camphor or unslaked lime in the tool chest, rusting can be prevented to a great extent.—L. B. Robbins, Harwich, Mass.

be found to be about the minimum width of table top upon which a sewing-machine head can be mounted. The depth of the opening must be governed by the size and design of the head. If at all possible, the cabinet should be built sufficiently high to leave space above the head of the machine for shelves to hold unfinished work, etc., and for one or two drawers below the end of the table top, when it is in a vertical position.

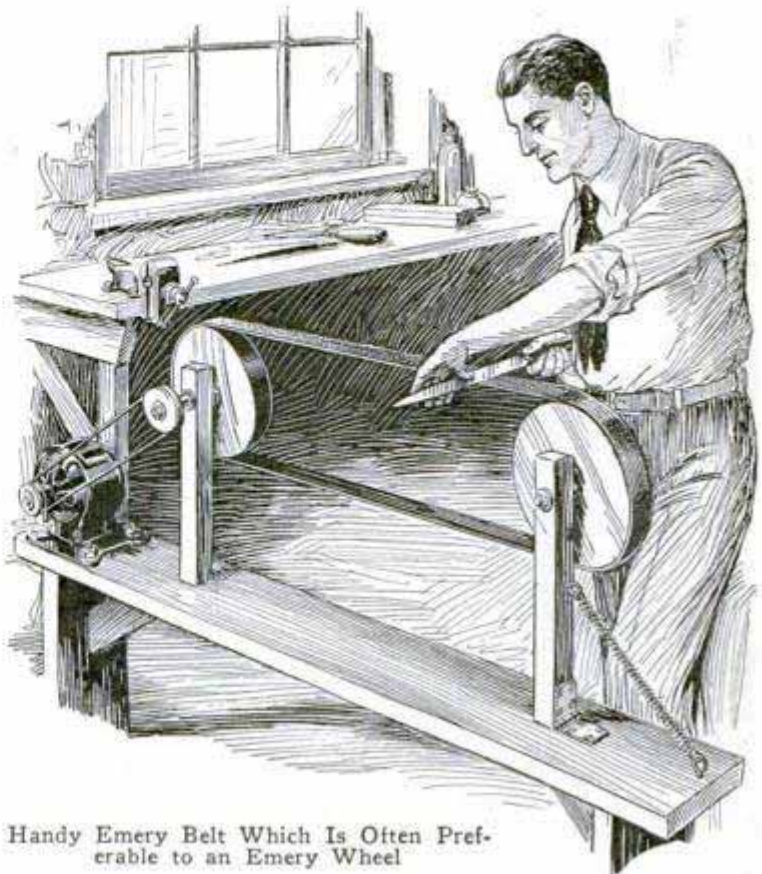
The general arrangement of the cabinet is shown quite clearly in the illustrations. The table top is 4 ft. 2 in. long over all, and, when it is down in position for work, the inner end rests under a cleat nailed to the back of the cabinet. The table top is pivoted to the sides of the cabinet so that, when it is in a vertical position, the bottom will just clear the back of the door.

Repairing the Plate-Holder Slide

When the wooden head strip of a hard-rubber slide of a plate or film holder breaks loose, because the rivets crack out of the rubber, do not use cement to repair it. The following method of repair has stood the test successfully: The hard-rubber sheet is replaced in its original position and reriveted. Make light prick-punch marks where the new rivets are to be placed in the unbroken part of the rubber. Take common brass pins as near the size of the old rivets as can be found and cut the heads off with enough of the shank to permit the latter to project a short distance through the wood. Place the rest of the pin, with the point inside, in the chuck of a small crank-driven hand drill and, using so little pressure that you seem to almost hold up the drill, drill with the pin shank, which has been lightly filed to a flat V-edge, right through both wood and rubber. Proceed to put in the first rivet as soon as its hole is drilled and add the others in like manner. When the rivets are all in place, turn the slide over and file off the projecting ends of the rivets, leaving enough to upset into the wood by a few taps with a light hammer.

Compact Trash Box

A compact and easily cleaned trash box has been developed and put in use in the navy. It consists of two parts, top and bottom, which are made of sheet metal and wood, respectively. The bottom part can be easily cleaned because of its short walls. The box is sanitary and may be made in any size required.



Handy Emery Belt Which Is Often Preferable to an Emery Wheel

Emery Belt Substitute for Wheel

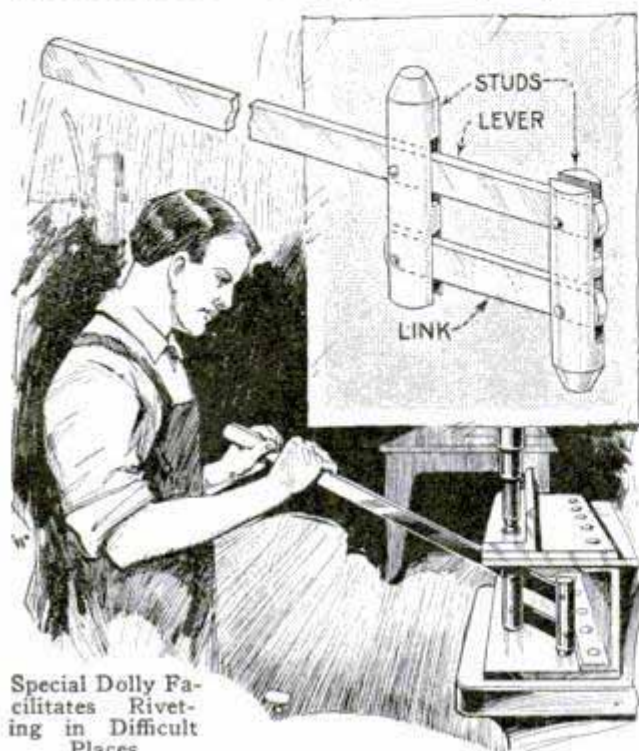
There are many occasions where an emery belt of the kind shown in the drawing is preferable to an emery wheel. Mount two wooden pulleys to accommodate the belt, as shown, and attach a small pulley to one of them so that the outfit can be run by an electric motor. One of the standards carrying the large pulleys is hinged at the bottom, and a coil spring is fastened between it and the base to keep the belt tight.—Carlton Groat, The Dalles, Oreg.

Restoring Oil-Stained Concrete

Where concrete floors and driveways of garages, filling stations and machine shops are stained with oil, the following method can be used to restore them: First wipe off the excess oil and scrub the stains with kerosene or gasoline, which will remove most of the oil. Then flush with clean water, sprinkle on some dry cement while the surface is still wet and brush it over evenly with a broom. Because of the moisture, the cement sets and adheres firmly, making a spotless surface, as stains that were not removed by scrubbing will be covered by the new cement.

Dolly for Backing Rivets

Supporting a rivet between plates, under channel ends, inside of small tubular members, and in other places equally hard



Special Dolly Facilitates Riveting in Difficult Places

to get at, is an easy task with the special dolly shown in the illustration. It consists of one long bar, a short link and two studs, which are joined with the link and the lever by swivel pins, making a flexible assembly. The studs are concave and either of them may be used to back up the rivet. They should be hardened at the cup.—G. A. Luers, Washington, D. C.

Double-Service Screwdriver

In going over the country putting on an automatic screen-door lock, I used two different sizes of round-head screws. One was a $\frac{3}{16}$ and the other a $\frac{3}{8}$ -in. size. I carried two different sizes of screwdrivers, one to fit each



END VIEW

size of screw, until I conceived the idea of dressing down the end of the large one to fit both the small and the large-size screws. The method of filing down the screwdriver for this purpose is shown in the illustration. While this would not work on both sides of flat-head screws, it

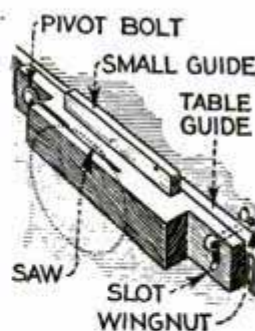
does well on round-head screws and on smaller sizes, the wide edges preventing the screwdriver from slipping off.—Samuel E. Schofield, Indianapolis, Ind.

Plastic Filling for Spike Holes

Instead of using wood plugs in enlarged spike holes, an Australian railroad uses an asphaltic compound consisting of the following ingredients: tar, 1 qt.; pitch, 4 oz.; bitumen, 1 lb.; kerosene, $\frac{1}{2}$ pt., and hardwood sawdust screened through a 100-mesh screen, 2 lb. The composition is prepared in the shops and distributed in cake form to the section gangs, who melt it with portable heaters. Enlarged spike holes are carefully cleaned out and filled with the hot composition, which is tamped in place. While the filling is still plastic, the spike is driven in place and after 15 minutes, when the composition has become hard, it requires a pull of about 4,000 lb. to withdraw a $\frac{5}{8}$ -in. cut spike.

Grooving Molding with Circular Saw

The illustration shows an easy and convenient method of grooving small molding on a circular saw. The attachment consists of a block of wood, 2 by 4 in. in dimensions, which must be cut according to the depth of the cutting edge of the saw for which the attachment is made. The block is bolted onto the table guide so that one end can swivel on it, and is tightened at the other, which has a slot in the form of a circular arch in it, with a bolt and wingnut. By raising and lowering this end one can vary the depth of cut. The block also has a guide which can be tacked on with brads.—Millard Loe, Blanchardville, Wis.



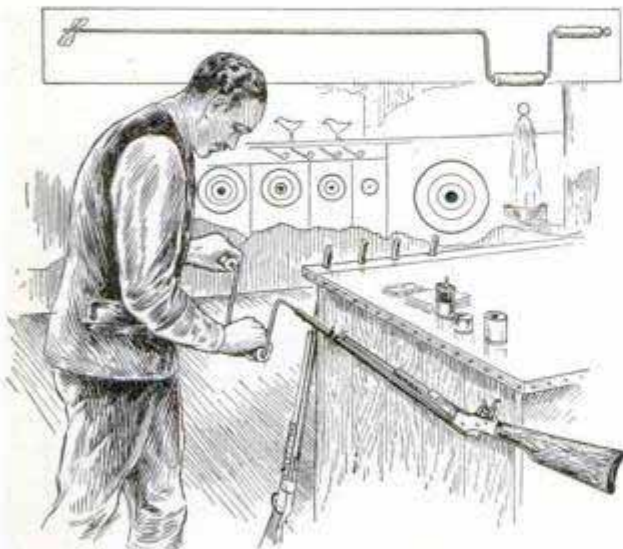
How to Protect Your Photo Tools against Chemicals

One of the troubles of the photographer is the gradual corrosion of the metal tools by the action of chemicals. Film clips, film-pack hangers and plate cages are

supposed to be proof against chemicals, but they are nevertheless seriously attacked by certain solutions. One photographer prolongs the life of these parts by placing them for a few moments in boiling water (40. oz.) to which is added 1 oz. of paraffin wax. This treatment deposits a thin coating of paraffin, that will not grease the fingers but is sufficient to protect the metal surface against the chemicals. Repeating the treatment every six months will keep the parts in good condition.—L. B. Robbins, Harwich, Mass.

Rifle-Cleaning Rod Resembles Carpenter's Brace

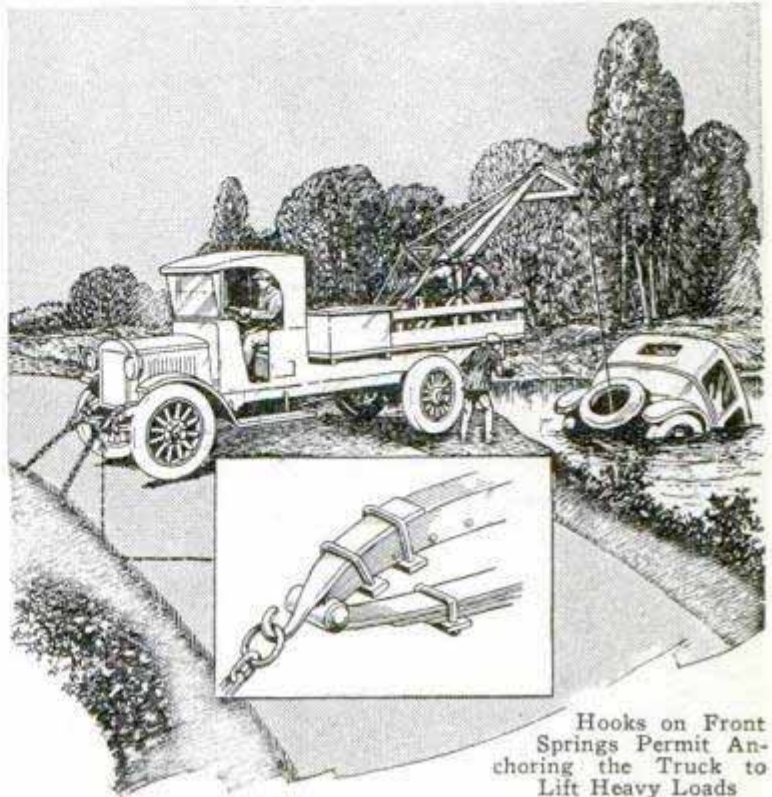
Cleaning rifles in a shooting gallery is a tiresome but necessary task that must be accomplished without loss of time when the rush of business is on. A Wisconsin shooting-gallery proprietor simplified this work so that it is almost an insignificant detail. A heavy pair of screwhooks are driven into one end of the counter, as shown, and upon these the rifles are hung, each in turn, and quickly swabbed by means of a cleaning rod shaped like a carpenter's brace, which is provided with free-turning handles. This cleaner is quickly inserted and, being turned as it enters and returns through the gun barrel, produces an effective double motion.



Quick Method of Cleaning Rifle Barrels with Cleaner Shaped like a Brace

Hooks on Truck Springs Found Handy

The installation of heavy hooks on the ends of front springs of trucks has been found convenient, especially on wrecking



Hooks on Front Springs Permit Anchoring the Truck to Lift Heavy Loads

cars carrying a crane. When the crane is used to lift a heavy weight, the front end has a tendency to rise, but by anchoring it securely with chains slipped over the hooks on the springs, as shown in the drawing, the trouble is entirely eliminated. If the truck is stuck in a mud hole, the hooks are handy for hitching to a tractor or another truck, and there are several other purposes for which the hooks can be used.

Preventing Nail Streaks on Siding

It is very unworkmanlike to neglect to prime the siding as soon as it is put on, as the nail heads begin to rust immediately and leave objectionable stains on the wood, which may penetrate succeeding coats of paint. If it is not desired to prime the wood at once, the trouble can nevertheless be prevented by heating the nails to a high temperature and throwing them into a pot of raw linseed oil. After a few moments the oil should be drained off and the nails will have no tendency to rust.—L. H. Georger, Buffalo, N. Y.

Tool for Breaking Seals and Removing Milk-Can Covers

In a Wisconsin creamery, where many wire-sealed cream cans are received daily,



Simple Tool for Breaking Seals and Removing Milk-Can Covers Quickly

the proprietor found that the employes were using a hammer to break the seals and loosen the tight-fitting lids, with consequent damage to the cans. To save the cans and simplify the labor, he devised the tool shown in the drawing. It consists of a block of wood, cut to the shape shown and three heavy screwhooks driven in at the points indicated. To break the seal the tool is placed across the can, with the hook inserted through the loop of the wire, and a quick upward pull accomplishes the trick. To remove the lid the tool is held perpendicularly, with the two end hooks engaging the cover handle, as shown in the center and lower details. By pushing the tool back and forth,

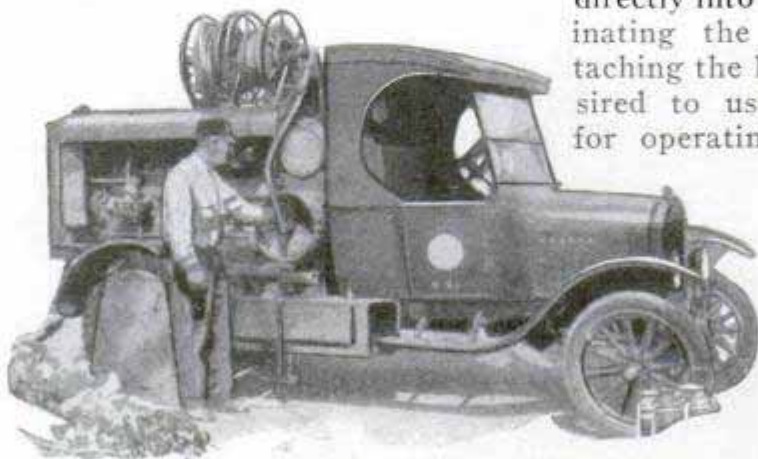
the lid is loosened so that air enters the can, which permits one to remove the lid in an instant. After the use of the tool was explained to the workmen, it was found that the two motions could be accomplished easily and quickly.—G. E. Hendrickson, Argyle, Wis.

Grafting Trees

The greatest difficulty in grafting fruit trees is the proper application of the grafting wax, which is especially true with spring grafting, when the weather is so cold that the wax congeals before it can be done. The trouble can be eliminated, however, by binding the graft to the tree with ordinary tire or friction tape, all around the edges, taking care that the tape adheres tightly to all parts of the graft, so as to make the incision absolutely waterproof. Of course, it is necessary that a good job of grafting be done, but it is also important that the grafting be thoroughly waterproof.—Charles Edward Gardner, Herndon, Va.

Hose Reels Carried on Top of Air Compressor

The Pacific Telephone and Telegraph company operates several trucks, which are specially equipped with an air compressor and compartments for carrying tools. A 2-cyl. air compressor driven by a 4-cyl. engine is mounted on the rear of the truck. Two reels are fastened to the top of the compressor on which are wound 150 ft. of air hose, the hose being connected through the axle of the reels to the air tank, permitting the air to flow directly into the hose and eliminating the necessity of attaching the hose when it is desired to use compressed air for operating machines. All



Large Reels on Top of Air-Compressor Truck Make It Convenient to Use the Hose

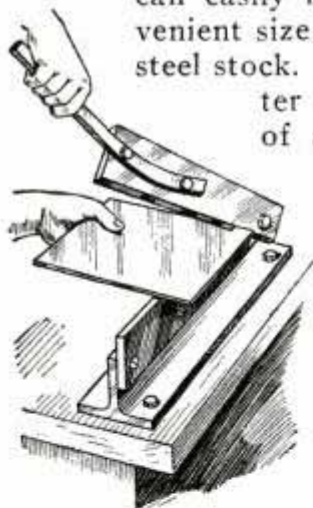
that is necessary is to unroll the hose and connect the air tool. This outfit has been found practical and timesaving.—C. W. Geiger, San Francisco, California.

Holder for Grinding a Nail Set

To insure having the end of a nail set square with its axis so that it will seat brads properly, a device for holding it while grinding will be found helpful. A small hardwood block is obtained and a hole the same size as the end of the set is drilled in it. The tool is then driven through the block so that it will be perfectly square. The block is used to locate the tool on the rest of the abrasive wheel and rotated, the grinding being done until the end is full or flush with the block. Using the tool in this manner will always insure having the end square so that the tool cannot shift about and thus destroy what would otherwise be a well-finished surface. This device for grinding a nail set comes in handy in many woodworking shops where a great deal of skill and care is required to prevent marring the surface of the work.—H. W. Swope, Danville, Pa.

Shears for Light Sheet Metal

A pair of shears for cutting brake-band lining, light sheet metal and similar work can easily be made in any convenient size from a few pieces of steel stock. The base of the cutter is made from a piece of angle iron to which

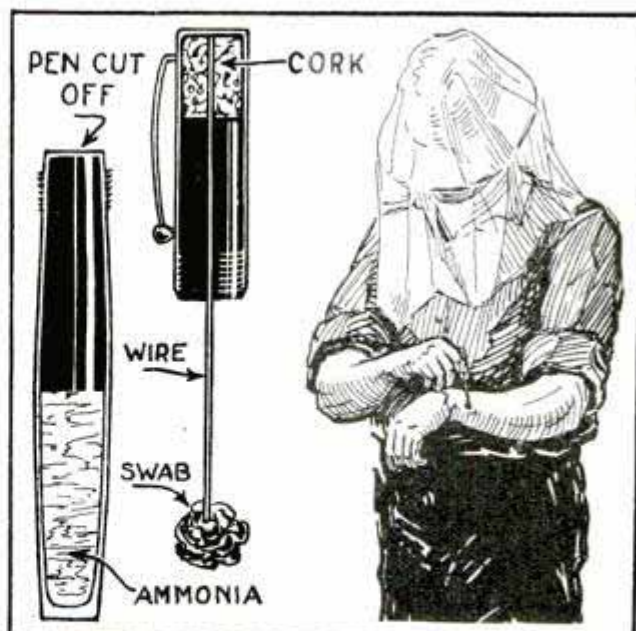


one of the shear blades, of $\frac{1}{4}$ -in. flat steel is bolted. The movable cutting blade is made from a similar piece and need not be hardened for cutting soft materials. This blade is attached

to the lower one with a bolt, as shown, and a suitable handle is made from a piece of lighter stock and attached as indicated.

Pocket Bee-Sting Kit

The bee worker, who is in the field a great deal, will find the bee-sting kit shown in the drawing of considerable use. Saw off the barrel of an old fountain pen as indicated, but leave the threads for the cap to screw in place. Wash the inside of the

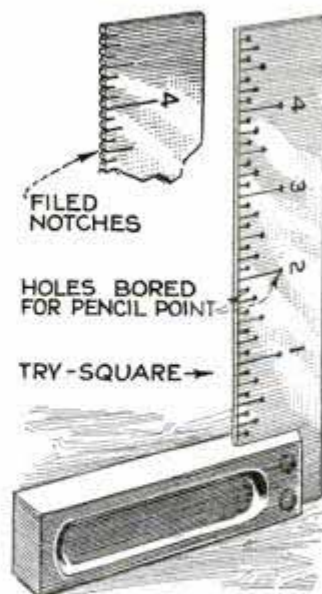


Handy Bee-Sting Kit Which Can Easily Be Made from an Old Fountain Pen

barrel thoroughly with boiling water. Push a piece of stiff steel wire into a cork driven into the end of the cap. On the other end of the wire, fasten a cotton or felt swab. Fill the barrel nearly full of pure ammonia, place the swab inside and screw the cap down tight. Ammonia is one of the best antidotes for bee poison and should be applied to the sting liberally. The kit is carried as a fountain pen and the ammonia will not leak out if the outfit is kept in an upright position.

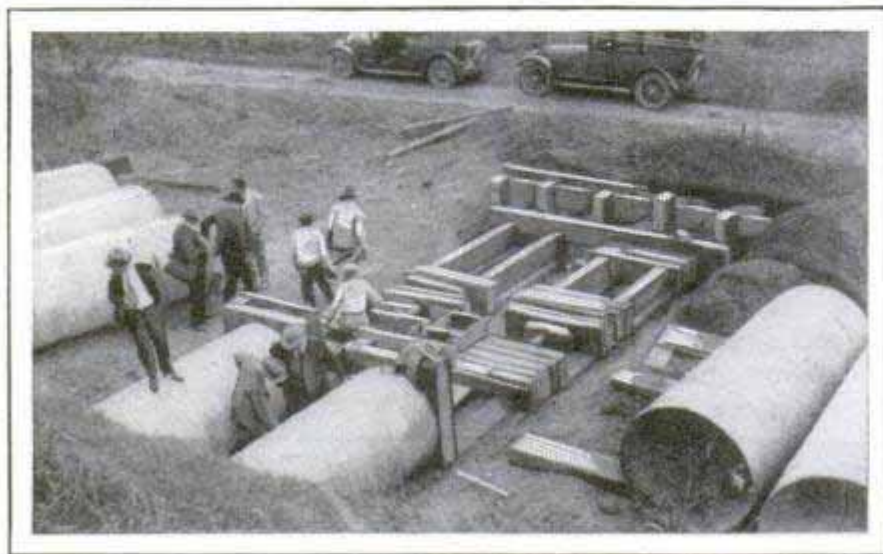
Improved Try Square

A carpenter's try square may be improved by drilling a series of $\frac{1}{16}$ or $\frac{3}{32}$ -in. holes along the rule, as shown in the illustration. These holes prevent a pencil point from slipping to one side, when drawing a rip line on a door, sash or other piece to be ripped. If it is not desired to drill the rule, notches may be filed on the inside edge of the rule to answer the same purpose.—Richard C. Tarr, Gloucester, Mass.



Culverts "Jacked" through Embankments

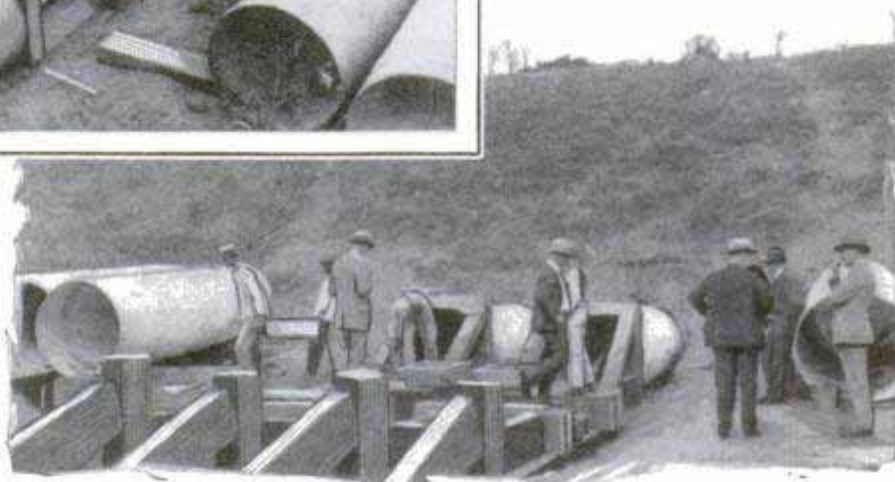
Forcing corrugated ingot-iron culverts through embankments with jacks is a new method tried successfully in several parts



Above, How a 48-In. Corrugated-Iron Culvert Was Pushed through a Railroad Embankment with 35-Ton Jacks, at a Considerable Saving of Labor

of the country. Two parallel 48-in. pipes have just been placed under the roadbed of the Missouri, Kansas and Texas railroad, near Dallas, to carry away the flood waters of a small creek. There was no interruption of traffic, for there was no new earth fill to settle after the culverts were installed as the solidity of the earth was not disturbed. With the grade levels and alinements established, the first sections of corrugated pipes were "ended" against the embankment. The laborers worked inside of the pipes, digging out the earth just ahead of

them. The loose earth was brought out in a wheelbarrow. The pipe sections rested on wooden runners. At the rear end of each was erected an upright framework of wooden timbers against which a 35-ton jack was set in a horizontal position. They in turn were backed by horizontal beams which rested against heavy upright timbers. When the tunnel was carried forward about 2 ft., the pipes were jacked forward, and when the



sections of pipe had all but disappeared into the earth another section was riveted on and then the digging and jacking were continued. When the job was completed, each culvert was one continuous unit of riveted pipe. It is estimated that from one-third to one-half of the installation cost of the culvert was saved by using this method as compared with the usual process.—Herbert W. Smith, Dallas, Tex.

Drying Films Quickly

Occasionally the professional photographer is called upon to turn out a finished photograph immediately, and most amateurs, who have learned to develop photos to any degree of satisfaction, sooner or later like to test their speed in making a finished print. Drying the negative preparatory to printing is the greatest problem, for when a wet film is hung up, it takes from six to eight hours to dry. To do it in a few minutes, fill a

tray with enough water to immerse the film and add potassium carbonate until no more will dissolve. After the negative has been thoroughly rinsed of all hypo, wipe both sides with a chamois skin, taking care not to scratch the film on the emulsion side; then immerse the film in the potassium-carbonate solution. At the end of a minute remove the film, and it will be dry almost immediately. It now remains only to polish both sides with a cloth and the film will be ready for printing.—Jack Honrine, New Bern, N. C.

A Pulley to Fit Any Shaft

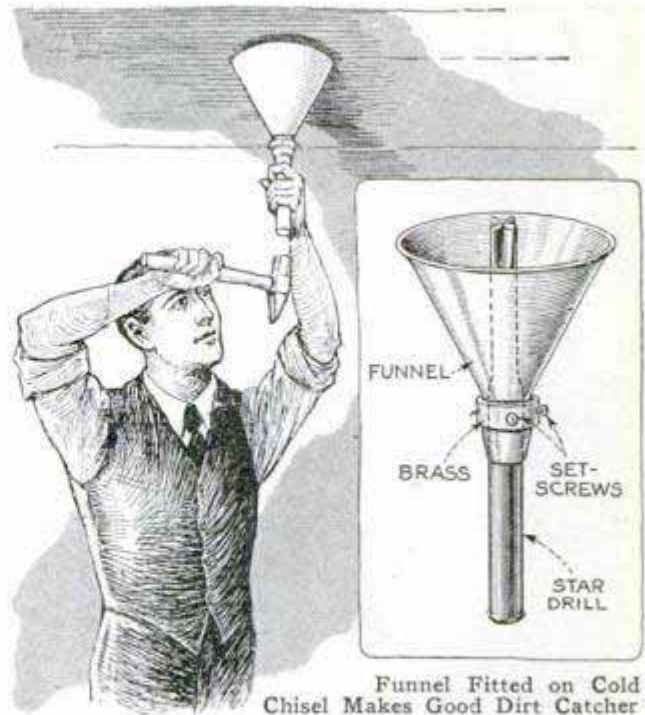
Small belt pulleys may be turned from two pieces of wood, which have been clamped to the shaft, while larger ones of any size may be made by bolting several pieces together with the grain of the wood at right angles, then clamping on the shaft and turning them to size. For smaller pulleys, two blocks are sawed from a piece of 2 by 4-in. wood, $3\frac{1}{4}$ in. long. Four holes are drilled through each of these and they are clamped together with bolts. A hole, $\frac{1}{16}$ in. smaller than the shaft on which the pulley is to fit, is drilled to cut half the hole from each of the blocks. The holes are then countersunk so that the heads of the machine bolts will come about $\frac{1}{4}$ in. beneath the surface when the pulley is turned. Slots may be cut in the heads of the bolts so that a screwdriver can be used, thus eliminating the need of countersinking such a large hole as would be necessary for a socket wrench. The blocks are clamped to the shaft near a bearing and where a rest for a chisel or gouge can be easily improvised. With the power applied to the shaft, the blocks are revolved and turned off with a gouge until they are brought down to the proper shape and size.—Wendell Mitchell, Rogers, Nebr.

Blocking Autos in Freight Cars

A large automobile-manufacturing plant is making a saving in the materials used in blocking autos in freight cars, by using iron straps, nailed to the car floor and fastened at the top ends to the rim



bolts, two straps to each wheel, one in back and one in front. Besides being economical in cost, the straps not only save considerable time to the unloading crews, but are much more convenient in use.—Richard C. Tarr, Gloucester, Mass.



Dirt Catcher on Cold Chisel

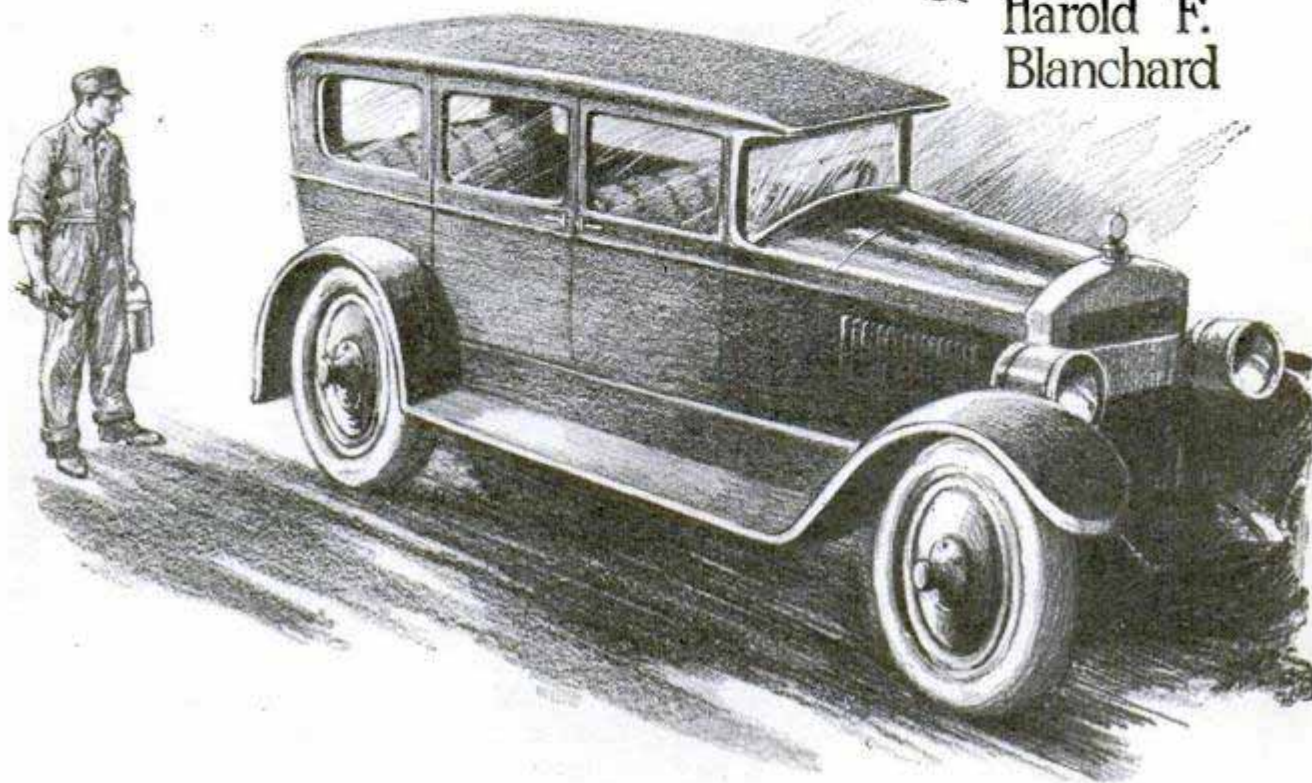
Electricians and others who use cold chisels, for overhead work in plaster or concrete, will find the funnel attachment to a cold chisel, as shown in the illustration, a great convenience, as it catches chips and dirt which might otherwise fall into the worker's eyes. Get a large tin funnel and cut off all but about 1 in. of the spout. Sweat a brass band or sleeve, made of $\frac{1}{16}$ -in. stock, to the remaining part and drill and tap three holes for screws. Slip the funnel over the star drill or chisel and drive the screws tight. Enough clearance should be kept between the end of the funnel and the end of the chisel to allow the user to see what he is doing.—L. J. Flugel, Chicago, Ill.

Birds Keep Flies from Cattle

Last summer when visiting a farm, where the cows were standing about the barnyard without any annoyance during the fly season, I inquired as to the cause. "Oh, I've a squad of little martins working for me," the farmer told me, and looking about, I saw a number of the birds hovering over the dairy herd, even flying into the barn to catch a few flies. This cow comfort, with an increased revenue of milk, was obtained by building some martin houses around the barnyard fence.—J. H. Deniston, Bayfield, Wis.

How to REPAINT YOUR CAR LIKE AN EXPERT

by
Harold F.
Blanchard



ALMOST every amateur who has re-finished his car with auto enamel or varnish has been dissatisfied with the result. He starts out optimistically, hoping to put on a finish as good as that applied by the professional painter, but alas! when the job is done he finds there are dust specks and brush marks in the surface, and that here and there the paint has slowly flowed down the surface to collect in a "sag" or "run."

What mystifies the amateur is how the professional painter avoids these defects. Usually the amateur is likely to solve this mystery simply by assuming that the defects are avoided by superior skill acquired by years of practice. If the amateur, however, will adopt the five rules that the painter follows, a nearly perfect job will result. The rules are simply stated and rather easily observed, and the perfection of the job depends entirely on how carefully the rules are followed. Here are the rules: first, a clean room; second, a clean surface; third, clean material; fourth, clean brushes, and last, correct application. The first four items are rather ob-

vious, although they are not always followed; if they are, they will eliminate the dust specks, while the fifth, correct application, will eliminate the sags and runs.

The first thing to do is to determine whether your car is finished in paint, lacquer or enamel. Practically all cars built within the last three years have a lacquer finish, which means a coating having a nitrocellulose base, sprayed on and polished. Most older cars, as a rule, have a paint and varnish finish, with the exception of the Ford and the Dodge, which have a baked-enamel finish. One way of telling whether the finish has been lacquer or paint and varnish is that originally the latter was much more brilliant than even a new lacquer job is. For the purpose of this article, paint and varnish and baked-enamel finishes are grouped together, while lacquer-finished cars are considered as a separate group.

If a lacquer finish is merely dull, and not discolored or faded, it may be varnished to bring back the luster. Varnish is quite satisfactory over lacquer, provided the latter finish is more than a year

old. If the lacquer finish is less than a year old, it is not advisable to apply varnish, as it may flake off later. If the lacquer coating is discolored or faded, it should be repolished with rottenstone and oil. This is a good day's work. If the material is so thin that the polishing rubs through the color in spots, it is better to stop the polishing and give the car a couple of coats of auto enamel or brushing lacquer, according to taste.

If the car is finished in baked enamel, or paint and varnish, the owner is naturally interested in determining beforehand how the car is going to look when refinished, and the simplest way to do this is

Surfaces that have a dead, chalky feeling when the fingers are rubbed over them, cannot be expected to have a full gloss when finished with auto enamel or varnish. This is caused by the fact that they absorb the finish coats to a greater or less degree. A surface of this character will actually look porous, while a "live" surface will look solid.

The next question to settle is whether to use varnish or enamel. Varnishing is permissible provided the paint coats have not faded or changed color to an objectionable degree. The proper time to re-varnish a car is before the original varnish coat has worn off. If varnish is de-



to wet the surface well. The car, when given a one or two-coat job, will look just about as it will when the surface is thoroughly wet; before the water is applied, the surface must be clean and free from body polish or grease.

cided upon, a good grade of spar varnish can be used with the best of results, although a painter would recommend a good finishing varnish for the work. Varnish of the latter kind, however, cannot be obtained in every hardware or even every paint store, so the spar

(3)

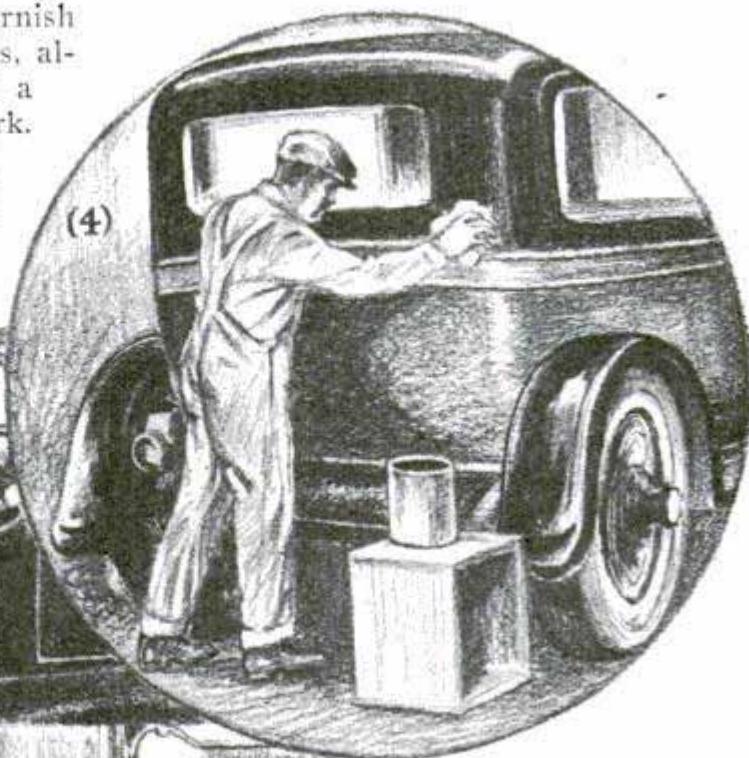


varnish is recommended, and it has the additional advantage that it dries more quickly than does the finishing varnish.

If the color coats have become very much faded or discolored, auto enamel should be used instead of the varnish, and, of course, if the paint is chipped off in places, the enamel must be used. In many cases a single coat of the enamel will be sufficient; if some of the original color shows through, or if the finished job lacks luster, a second coat should be applied, after the first has dried from 24 to 48 hours.

The first step in the actual painting of the car is to wash the walls, ceiling and floor of the garage with a hose (Fig. 1). Do not begin work on the car, however, until water has ceased to drip from the ceiling. This wetting down is very important. If the work must be done in a public garage, select as quiet a corner as possible, that is, where there is the least movement of either cars or men.

(4)



(5)

The brushes necessary are two good badger or half-badger brushes, one $2\frac{1}{2}$ in. wide and the other $1\frac{1}{2}$ in. wide. A second $2\frac{1}{2}$ -in. brush, which may be of cheaper quality than the others, should be bought and kept for painting the chassis, so that the brushes used on the body will not become dirty. The brushes

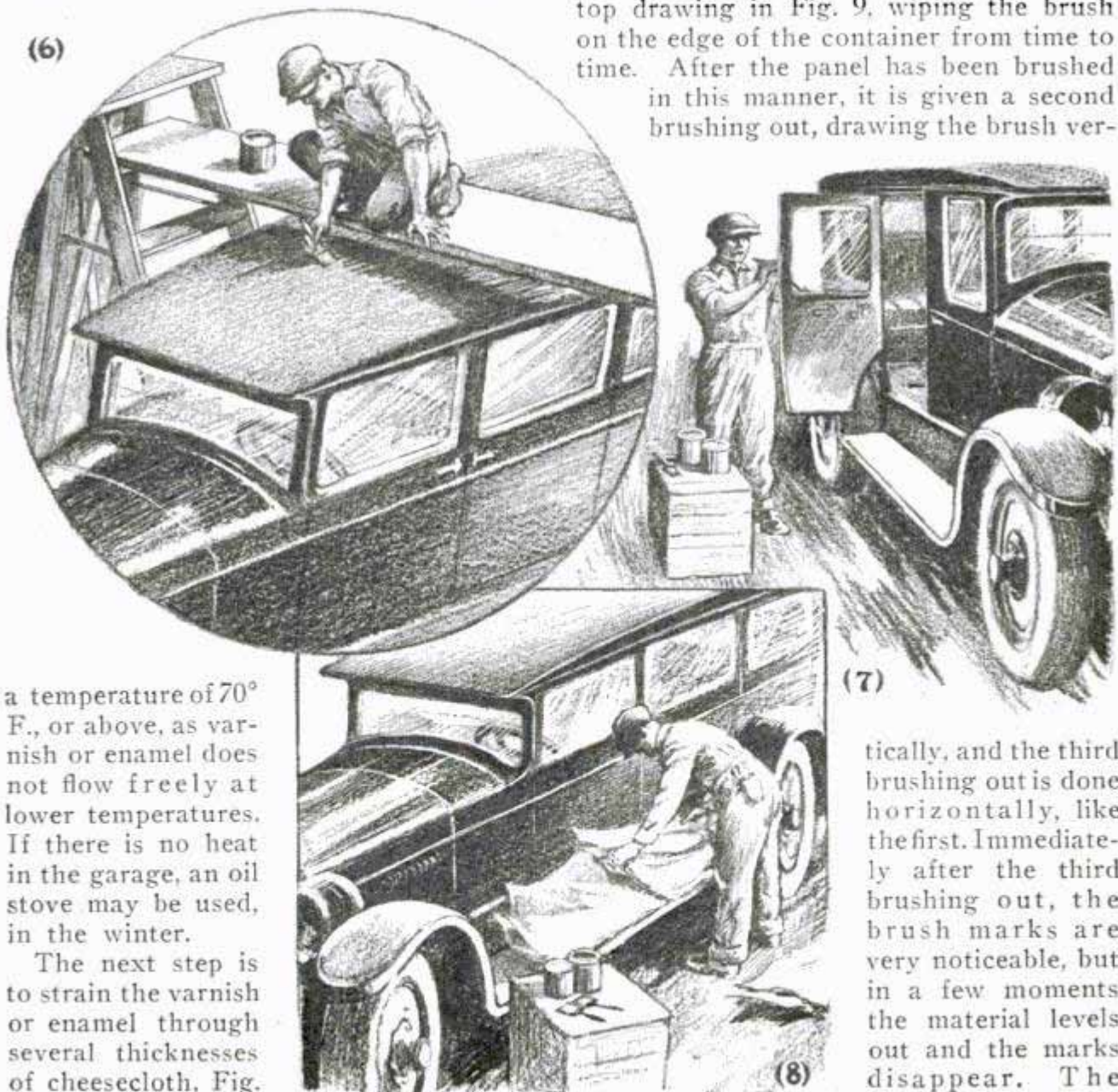
should be thoroughly worked out, dry, on a clean board, so as to get rid of the majority of the loose hairs before the painting is commenced, and slapped on the palm of the hand to remove most of the dust in them.

The next step (Fig. 2) is to wash off the car with a strong solution of good neutral soap and water, using a stiff brush to remove mud and grease as required. For a job of the kind described here, it is hardly necessary to go to the trouble of cleaning and painting axles, springs and frame, although, if this is desired, they should be washed now and painted, when all the rest of the job is finished, with the "dirty" brush. The car should now be wiped off

with gasoline, sanded with wet No. 0000 sandpaper (Fig. 3) to remove any trace of body polish, tar or grease, wiped with a sponge full of water and dried with a chamois. Rust spots should be polished bright with the sandpaper. Finally the car should be wiped over with a yard of cheesecloth wrung out of varnish, to pick up all small particles of dust, as in Fig. 4. Pay particular attention to the corners, for if any dust is left there, the brush will pick it up and drag it over the surface.

During the painting, every effort should be made to guard against drafts, and no one but the painter himself should be allowed to enter the finishing room, as the movement of other people will stir up particles of dust unnecessarily. The work should preferably be done in a garage at

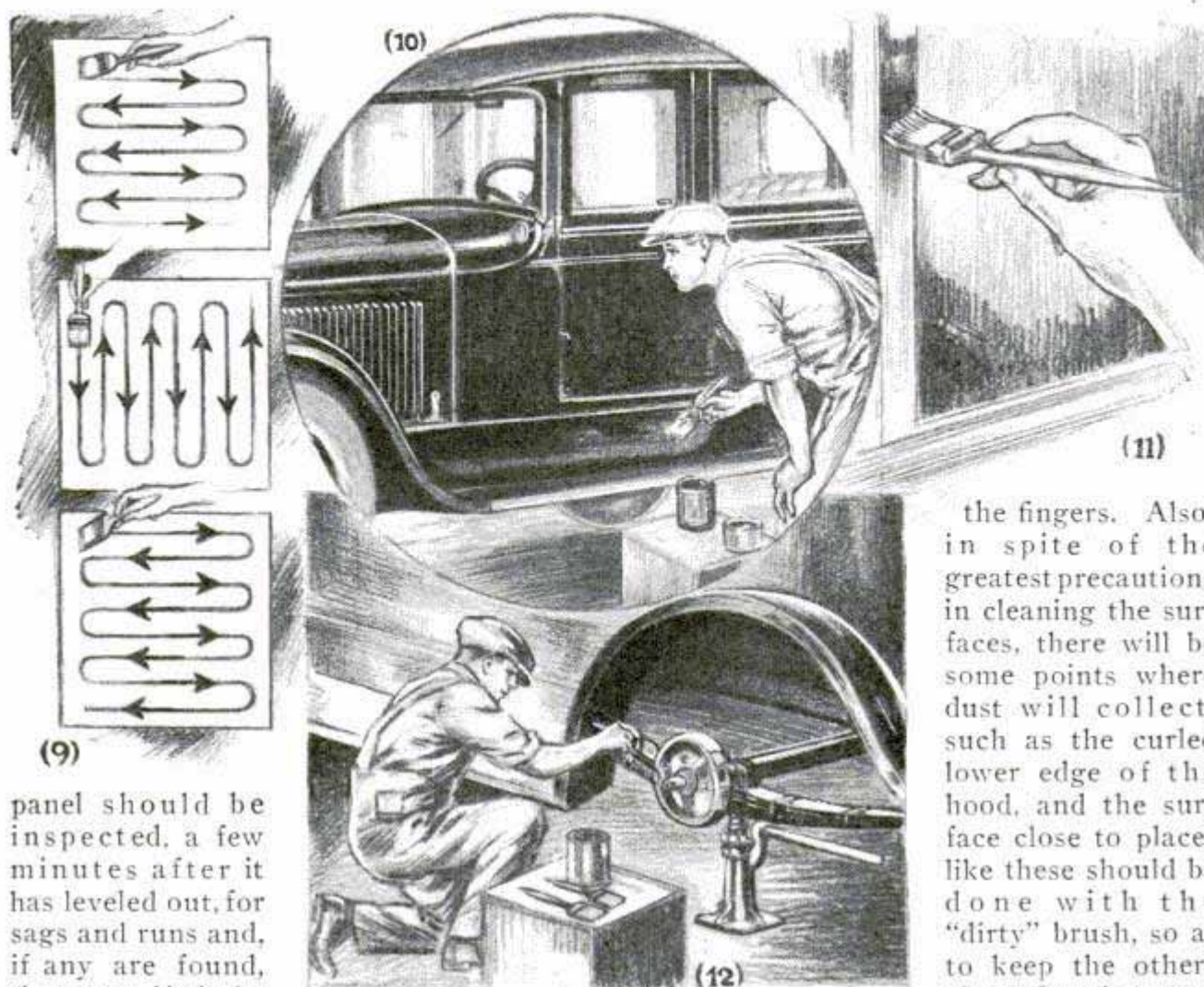
5, taking care that the receptacle into which it is poured is clean and free from dust; then pour some of the enamel into a pint cup or container and use this during the painting. The secret of correct application lies in the method of brushing rather than in the skill with which it is done, and this is where most amateurs fall down—their method is wrong. One panel should be done at a time, as a door panel, for example; the enamel is laid on rather heavily until the whole surface is covered and then the panel is "brushed out" three times. Brushing out consists in removing the excess material with the brush. After the whole panel has been covered, the brush is wiped on the edge of the pint container and the panel is then brushed back and forth horizontally, as shown in the top drawing in Fig. 9, wiping the brush on the edge of the container from time to time. After the panel has been brushed in this manner, it is given a second brushing out, drawing the brush ver-



a temperature of 70° F., or above, as varnish or enamel does not flow freely at lower temperatures. If there is no heat in the garage, an oil stove may be used, in the winter.

The next step is to strain the varnish or enamel through several thicknesses of cheesecloth, Fig.

tically, and the third brushing out is done horizontally, like the first. Immediately after the third brushing out, the brush marks are very noticeable, but in a few moments the material levels out and the marks disappear. The



panel should be inspected, a few minutes after it has leveled out, for sags and runs and, if any are found, they are lightly brushed out. These defects are best located by sighting along the panel with the eye as close as possible to it, as in Fig. 10. Sags and runs are particularly likely to be found on such surfaces as the curve of the upper hood panel, and beneath such parts as door handles. On the first brushing out, bear rather heavily on the brush, more lightly on the second and very lightly on the third.

The professional painter uses the 1½-in. brush in the operation for outlining the panel, as in Fig. 11, filling in with the 2½-in. one. All fine work, such as the painting around door handles, painting window frames, etc., is done with the 1½-in. brush. Brushing out is done, wherever possible, with the 2½-in. brush, but as a final operation on door panels, the edges are brushed out with the 1½-in. one.

Any brush will shed a few bristles during the painting operation, and a bristle on the surface may be picked up by stabbing it with a corner of the brush, then removing the bristle from the brush with

the fingers. Also, in spite of the greatest precautions in cleaning the surfaces, there will be some points where dust will collect, such as the curled lower edge of the hood, and the surface close to places like these should be done with the "dirty" brush, so as to keep the others clean for the more

prominent surfaces. Looking at either side of the car, the panels should be done in the following order: top of hood, side of hood, front fender with splash apron, top and side of cowl, front door, panel between doors, rear door, panel behind rear door, rear fender, top back panel, lower back panel, apron above running board, and splash apron under radiator. Generally speaking, it is best to work from the top down, so the very first step would be to give the top a coat of dressing (Fig. 6), and the second to paint the windshield frame and the headlamps, if the latter require it. On closed cars the upper part of each door should be done just before the lower half. When the sides of the hood are painted, they should be laid on the fender for convenience. While painting the body panels, newspapers should be laid on the running boards, to keep them clean (Fig. 8). If enamel or varnish falls on any unpainted surface, it may be removed with a rag wet in turpentine.

The final operation is to paint the

wheels, running gear, gasoline tank, axles, etc., with the dirty brush, unless they are exceptionally clean, in which case the other brushes may be used to do a somewhat better job.

Generally the complete job, from start to finish, will take about eight hours, and when it is done, the car should be allowed to stand at least 48 hours before you begin using it again.

How to Replace a Broken Spring Leaf

Where lifting equipment is not available for the purpose of replacing broken spring leaves of an auto, get a piece of 2 by 4-in. wood and cut it to fit between the two inside ends of the spring. A jack is set under the car so that the chassis will be raised, but not the spring on which the work is being done. It is then an easy matter to replace the broken leaf.—L. H. Hutchinson, Dallas, Tex.

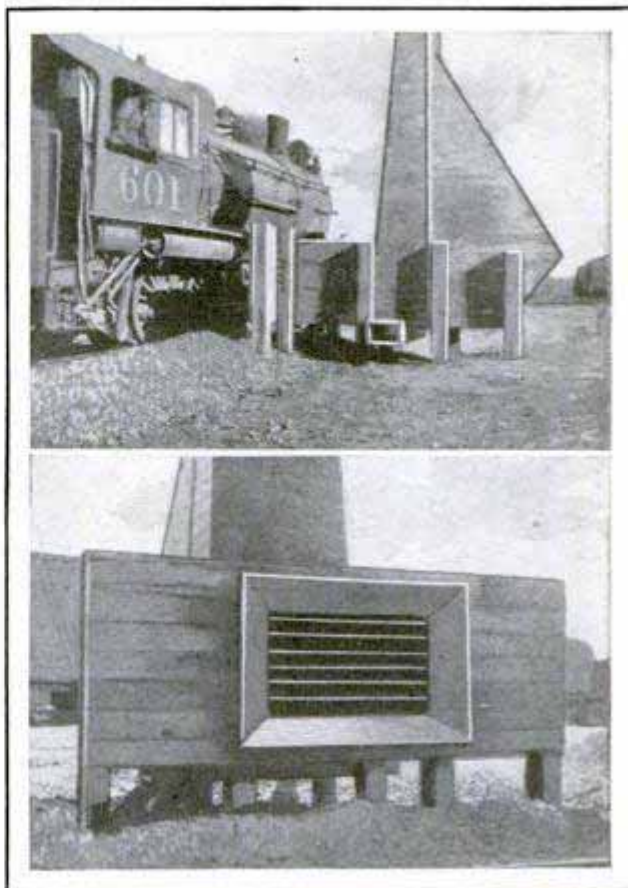
Counterweight on Farm Gate

Heavy farm gates of the swinging type can be made almost self-acting by means of a counterweight of stones. The upper bar, or crosspiece, of the gate is extended about 2 ft. beyond the hinged side and upon this extension is built a trough or a box, which is filled with stones of any convenient size and shape. The weight should be such that only a slight lift is required to raise the opposite end of the gate, which can then swing with ease. Although the gate shown in the photo is a crude one made from poles, the same principle may be applied with equal suc-



Stone Counterweight on Farm Gate Is Held on Extended End of Crossbar

cess to a gate made of boards, or a manufactured one having a steel frame.—Cyril E. Lamb, Ypsilanti, Mich.



Large Wooden Mufflers Reduce Danger from Steam When a Locomotive Is Blown Down

Safety First in Blowing Down Locomotives

The blinding cloud of steam and boiling water from a locomotive, when it is being blown down, is an annoyance as well as a danger to a passer-by in railroad yards. For the safety of the public, western railroads are now building large wooden mufflers adjacent to their roundhouses, into which the steam and water is directed when the mud valve is opened. The water runs out at the bottom, while the hot steam is directed upward through the chimneylike projection. Rods are placed across the mouth of the mufflers to prevent the possibility of anyone getting inside and being scalded.

Knocking Down Dry Corn Stalks

Knocking down dry corn stalks in fields in preparation for plowing for wheat was done in an Indiana field last season by the use of a telephone pole, 35 ft. long, attached to the bumper of an automobile. The car was driven over the ground, mowing down the stocks before it.—Mrs. Nellie L. Claybaugh, Frankfort, Ind.

Rubber Cuffs for Work Clothes

Some workmen snap a rubber band around their sleeves to keep them up, but



it is better to obtain an inner tube and cut out a pair of cuffs, about 6 in. long, as shown in the drawing. These will hold the sleeves down far enough to prevent getting them in some machinery. They may be sewed to the jacket to prevent losing them. The battery

man in a charging station noticed that brushing against the batteries was hard on his clothes and therefore made similar protectors, from large truck tubes, for his trousers. Half of each tube was cut away, except for several straps, which held the protectors in place. A slit was made at the upper end, through which he slipped his belt to support the protectors.

Gas-Engine Exhaust Pipes

For safety's sake, it is well to keep in mind the following points when piping the exhaust from your pumping engine or electric-light plant to the muffler outdoors. Always use a slightly larger pipe for the line than the exhaust opening in the cylinder head. For instance, for a $\frac{7}{8}$ -in. opening use a 1-in. pipe. Support the pipe along the walls so that no strain is brought upon the cylinder head, otherwise valve seats may be gradually warped or sufficient strain brought to bear on the head, eventually to make it crack. In making bends, use long bends instead of ordinary elbows, to reduce friction. Allow a clearance of 2 or 3 in. between the pipe and the sides of the hole through a wooden wall. Keep the pipe at least 9 in. away from any combustible material

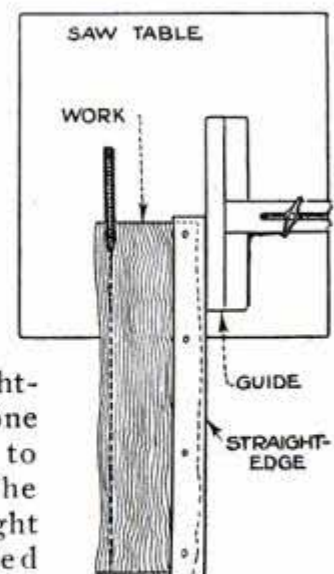
and, where the pipe passes through a double wall, place a protection over the pipe between the walls, such as a short length of asbestos steam-pipe covering or a loose-fitting stovepipe. Never cement the exhaust pipe into a wall. The expansion and contraction will tend to break up the cement and will also cause tremendous strain on the cylinder head. Use hangers, cemented into the wall with sufficient play to take care of the expansion of the pipe.

Repair for Enamelled Photo Trays

Photo trays often have some pieces of enamel chipped off, exposing the metal underneath. This soon rusts and it is, of course, an advantage to the photographer to apply a coating over the bare section, as rusty trays are highly objectionable. I have found the following method entirely effective, not only in case of photo trays but for all enamelled utensils: Dry the surface to be treated thoroughly, take a stick of sealing wax and melt a few drops on the rusty place to cover it. This will stick and dry immediately, and the tray will be ready for use again.—Warren Hubbard, Decatur, Ill.

Sawing Crooked Boards Straight

In order to do satisfactory work with a circular rip saw, it is almost absolutely necessary to have one edge of the material straight. If it does not come from the yards as straight as it should be, the difficulty can easily be overcome by using the method shown in the drawing. A straight-edge is nailed to one side of the board to make a guide. The dotted line at the right shows the crooked edge of the board and the dotted line at the left shows where the board is to be ripped.—H. H. Siegele, Emporia, Kans.



Starting a Two-Cycle Engine

One of the most common causes of a balky two-cycle engine is continuous priming with gasoline, and cranking. This cuts the oil film from the cylinder walls, lowers compression and makes it almost impossible to start the engine. The best remedy for this is to use a swab of waste on the end of a length of wire that is run through a cork and kept in a bottle of lubricating oil for oiling the cylinder. Remove the spark plug and swab the cylinder walls. This is more economical and more efficient than squirting the oil on with an oilcan. Replace the spark plug and prime lightly with a one-to-one mixture of ether and gasoline. The engine will then start at once if the crankcase is not flooded with gasoline.

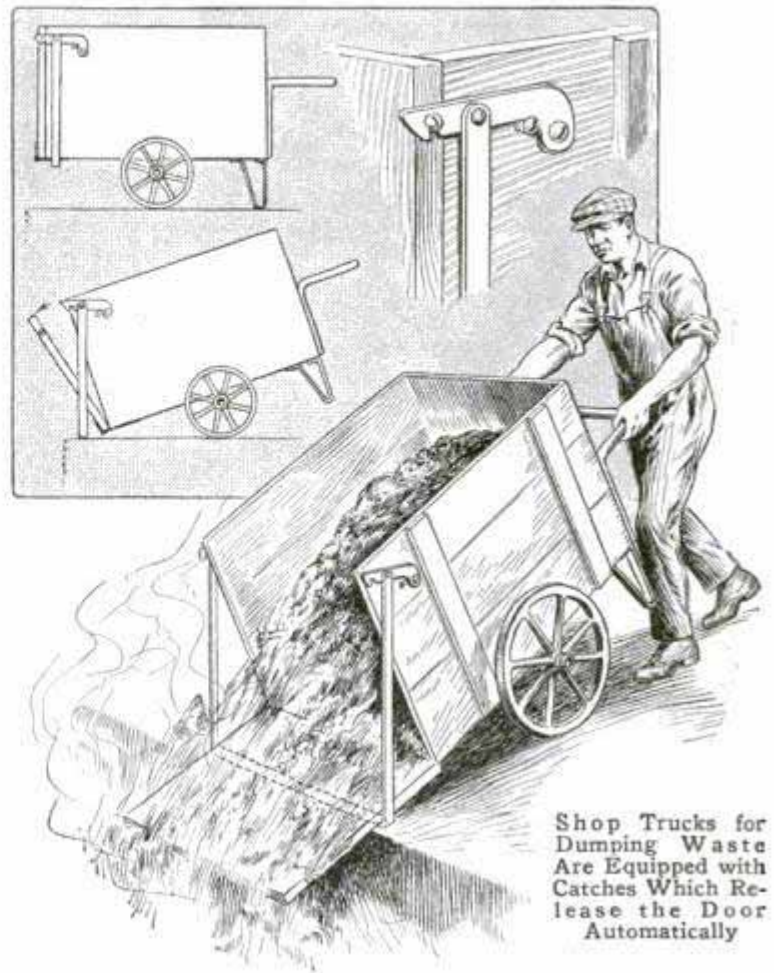
Valve-Spring Compressor

The illustration shows a tool which is very useful for compressing valve springs on auto engines. The spring is first put in the vise and compressed so that the tool can be slipped over it readily. After it is put in position and the valve and pin are replaced, pull on the handle and the tool can be withdrawn with little effort. Usually a separate tool has to be made for each kind of spring, but this one, though made for valve springs on Dodge cars, will do the work on four or five other types of engines.—Laurence W. Torell, Minneapolis, Minn.



Automatic Dumping Truck

An easily fitted attachment to an ordinary two-wheeled truck, such as is generally used to cart away the shop's waste and garbage, is a release for the door to



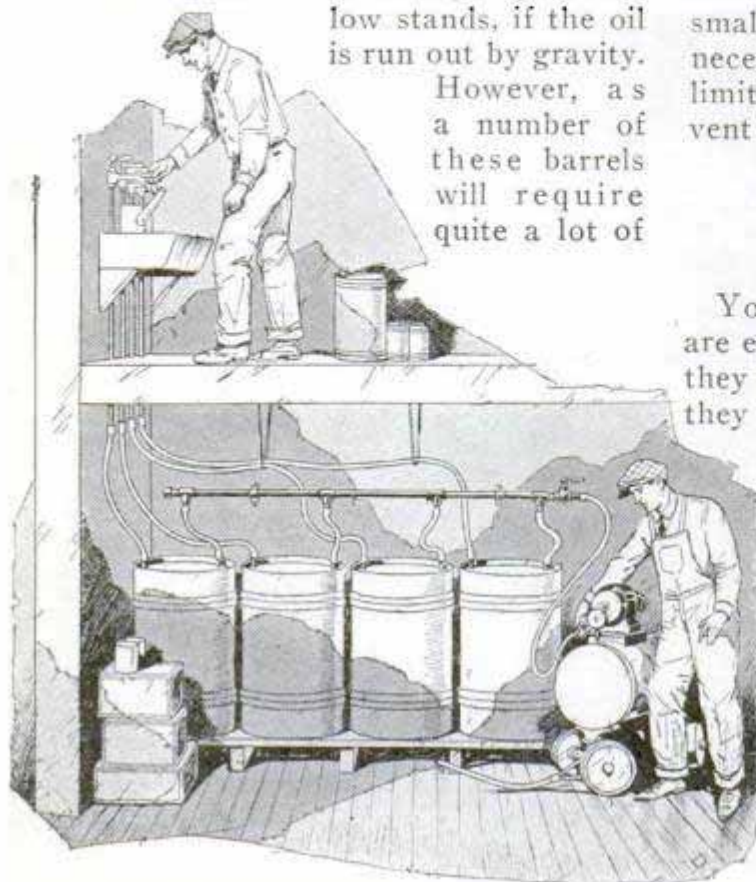
Shop Trucks for Dumping Waste Are Equipped with Catches Which Release the Door Automatically

facilitate dumping its contents. Although, in this particular case, a platform is used from which the waste is dumped into a depression in the earth, the attachment will work just as well on the ground. The door on the front of the truck is hinged at the bottom and two catches, one on each side, are fastened near the top. These catches are slotted to fit over a screw in either side of the door. The releasing piece is made of strap iron bent in U-form, and with both ends drilled to fit pins, which are driven into the catches. When loading the truck the door is shut and the catches are dropped over the screws. To make the dumping automatic, the front ends of the catches are rounded so that they ride up when the door is shut and a screw in the truck prevents them from falling down too far. When unloading the contents, it is only necessary to tilt the truck sufficiently to cause the release strap to strike the ground. This forces the catches up and the door flies open. In the picture, the truck is shown wheeled to the edge of the platform so that the contents are shot into the pit.—Harry Moore, Montreal, Can.

Novel Oil Dispenser in Garage

In most garages, oil barrels are set on the floor and provided with pumps or on low stands, if the oil is run out by gravity.

However, as a number of these barrels will require quite a lot of



Novel Oil Dispenser in Garage Uses Air Pressure to Force the Oil through Piping

space, which could be used for other purposes, one garage man placed the oil barrels in the basement and used compressed air to force the oil up to the first floor, as shown in the illustration. The barrels are put in line along the wall and the compressed-air line is fitted with a number of tees, which have nipples screwed into them for the attachment of heavy composition hose, with which connection is made to one of the top plugs in the barrels, as indicated, short nipples being tapped in the plugs. The other plug of each barrel is similarly tapped but the pipe is longer so that it extends to the bottom of the barrel besides projecting a couple of inches above the plug for the attachment of another length of hose, which in turn is connected to the pipes that pass through the floor as shown. These are provided with cocks at the upper end and a drip pan is set underneath to catch any overflowing oil. Each cock is labeled to indicate the oil it conveys, preventing mistakes. Care must

be taken to have all connections tight, and hose clamps should be provided for this purpose, as the oil, being under considerable pressure, will be forced out of any small leak and this would mean an unnecessary waste. It is also necessary to limit the pressure on the barrels, to prevent them from bursting.

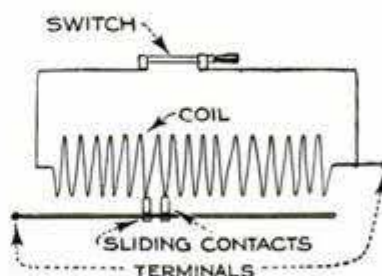
Proper Widths for Stair Treads and Risers

You have often noticed that some stairs are extremely hard to mount. Sometimes they are too steep and narrow, or again they may be too low and wide. It is all a matter of proportion of the width of the tread and the riser. A 10-in. tread and a $7\frac{1}{2}$ -in. riser make a good combination, but an 11-in. tread and a 7-in. riser are preferable. In case of attic stairs it may be necessary to have narrow treads and comparatively high risers. For this purpose a 9-in. tread and an 8-in. riser or a 7-in. tread and a 9-in. riser may be used. Of course, all the treads and risers must have the same width and height, for if there is any difference the odd step will cause trouble. It is also remark-

able how much a landing helps in climbing a stairway, and, therefore, if there is any possibility of providing one without wasting space, it is always advisable to do so.

Doubling Capacity of Slide Rheostat

By arranging an ordinary slide rheostat as shown in the diagram its current-carrying capacity can be doubled. An extra contact is provided on the slide and the terminals of the resistance coil are connected to

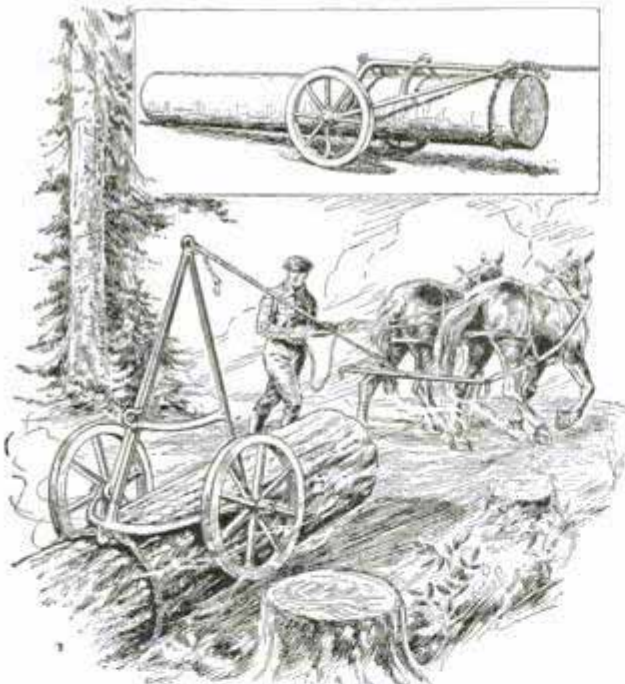


a switch as shown. With the two sliding contacts placed at the center of the coil, the current entering the slide at the left-hand terminal will divide between the two halves of the coil and pass out at the other terminal. The resistance of the coil

will then be just one-fourth of its resistance when only one sliding contact is used. The current is increased by moving one or both contacts toward the ends of the coil and a much finer gradation of steps in large currents is possible in this way. When the rheostat is to be used with only one contact, the switch is simply opened.

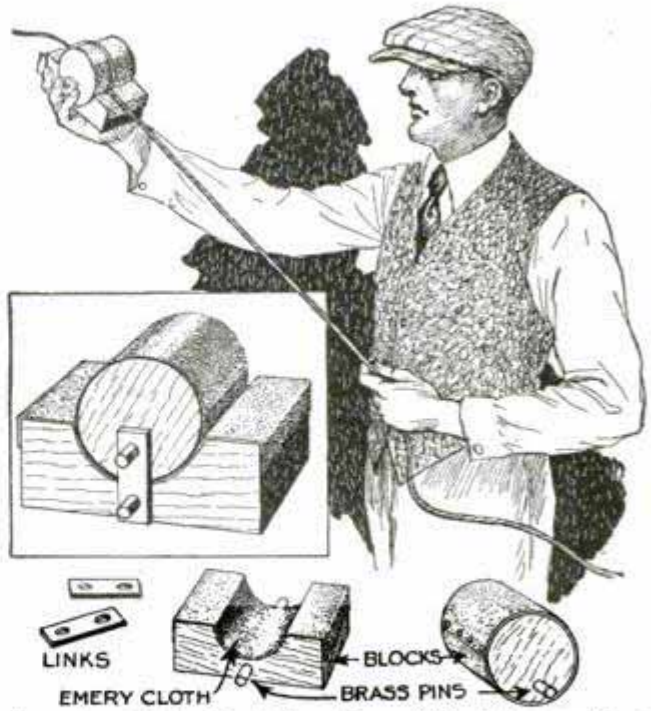
Single-Team Log Hauler

One team can easily pick up a huge log and haul it to the mill with the log hauler shown in the illustration. The device can be made by any blacksmith and its cost should not exceed \$35. In use, the hauler is run over the log, just in front of the center, so that the front end will not drag on the ground, and is hooked to a strong chain, slipped around the log. The team is hitched to the tongue of the hauler, as it is standing vertically, and the tongue is pulled down, which raises the front end of the log above the ground. A chain around the



One Team Can Haul Huge Logs to the Mill with This Device

foremost end of the log, as indicated in the top insert, will be found a considerable advantage, as it greatly facilitates the hauling.—P. J. Geerlings, Chicago.



Scraping Light Insulation from Wire between Two Emery-Paper Covered Blocks

How to Remove Insulation from Wire

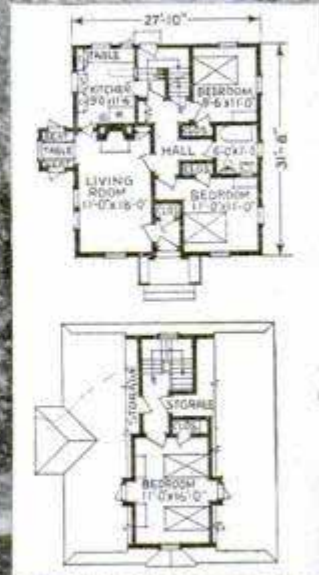
Most electricians are familiar with the method of using a piece of emery cloth to rub insulation off wires, after they are stretched and fastened at the ends. An improvement on this method is shown in the drawing. Fasten emery cloth to two blocks, one cylindrical and the other flat with a depression of the same curvature as the cylinder, and connect these blocks with two brass links. The wire to be stripped is wound around the cylinder once and by simply pulling the end, the emery cuts off the insulation.

Curing Leaky Gasoline Line

Ford gas-feed pipes sometimes leak persistently at the packing nuts on the ends, even when new packing is installed. This is often caused by the tubing being flattened, compressed or scratched at the end where it enters the packing nut. If about 1 in. is cut off the end of the pipe with a hacksaw, a tight joint can often be made. The feed pipe on some models is rather short for this, but in most cases the tubing can be bent a little differently to give sufficient length after cutting it.

IN accordance with the editorial policy of this magazine never to accept compensation in any form for what appears in our reading pages and also to avoid the appearance of doing so, we are obliged to omit the name of the maker or the seller of any article described. This information, however, is kept on file and will be furnished free, by addressing Bureau of Information, Popular Mechanics Magazine, Chicago.

Is This Your Home?



Copyright, Architects' Small House Service Bureau

Plan No. 4A14

QUESTIONS regarding home building addressed to this magazine will be answered by The Architects' Small House Service Bureau of the United States, Inc., controlled by the American Institute of Architects and endorsed by the United States department of commerce. Inclose 10c and self-addressed envelope. Blueprints, specifications and material list for the house shown here may be obtained at nominal cost. Inclose self-addressed stamped envelope for reply. If further information is desired, send 5c and stamped envelope for a 24-page booklet explaining how the Small House Service Bureau functions and showing 12 sample plans. A new booklet, entitled "Fifty Ways to Lower Home Building Costs," illustrated by ten bureau houses actually lived in, and showing how as much as \$1,000 can be saved on a home, may be obtained for 20 cents.

HERE is a small bungalow whose good proportions, varied roof lines, well-spaced windows and handsome entrance doorway all combine to give this house the marked distinction in style characteristic of the small house-service bureau's plans.

This bungalow is most practical in design and can be built as a home complete on one floor, or the second floor can be finished so as to give a third bedroom and large trunk or storage space. This third bedroom is eleven by sixteen feet, and has windows on three sides, so that it is in little danger of being stuffy and warm in hot weather, as is often the case with attic bedrooms.

The house provides, on the first floor four good rooms, a dining alcove, bath, two bedroom closets, linen closet and coat closet. The bedrooms have been grouped on one side of the house, thus providing them with the privacy equivalent to the sleeping rooms of a two-story house. This is according to the principles of good home planning, but it is not

found in poorly laid-out bungalows. This bungalow sits low and snug to the ground and, although it might be called a story and one-half house, it carries out the horizontal spirit that is essential to the one-story type.

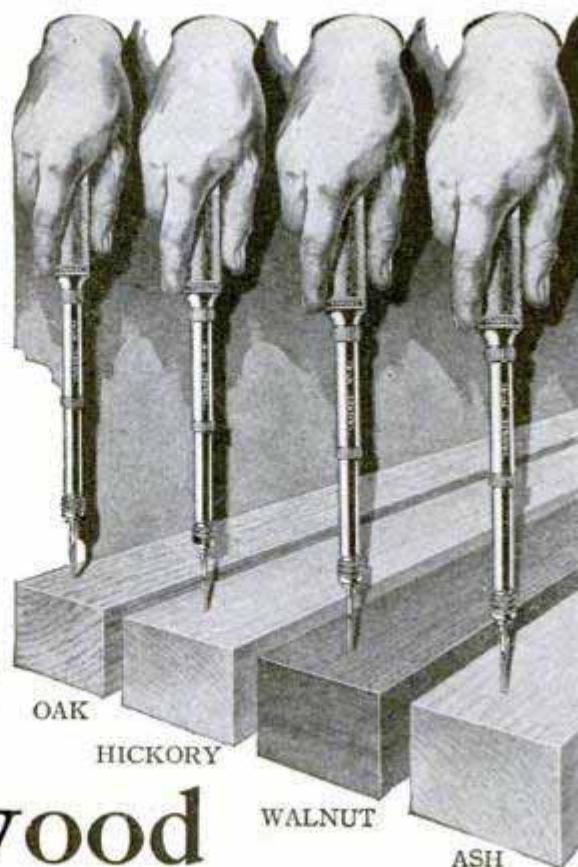
Approximate size of lot: Forty to forty-five feet wide. Material used: Frame construction with exterior finish of wood siding and wood shingle roof. Width: Twenty-seven feet ten inches, plus the dining alcove. Depth: Thirty-one feet eight inches. Facing: If the house as illustrated here does not face to the best advantage on the lot, the plan can be reversed.

Home Builders' Questions

Q. Will you tell me the comparative lasting qualities of the different kinds of wood as used for shingles?
A. Any of the woods commonly used for shingles will give you good service if you get a high-grade article. The objection to wooden shingles comes from the use of inferior materials. If you get a straight-grain clear shingle, sawed not thinner than five shingles to two inches, you will have a highly durable article. If the shingles are pressure-creosoted or oiled, durability will be increased.



Eight drill points 1-16 to 11-64 inch in handle. And every one of them has been given the "Yankee" individual test.



Any wood seems soft to a "YANKEE" Push Drill

EVEN in the hardest wood, the action of "Yankee" Automatic Push Drills is unusually smooth and easy. With only the slightest push, the point quickly bites its way inward. "Yankee" ingenious design and "Yankee" superior construction reduce time and labor to a minimum. Drill point revolves backward in upward movement of handle to clear chips. No. 41 (illustrated). No. 44 has spring for regulating pressure according to nature of wood; size of drills, etc.

Some Other "Yankee" Tools

Ratchet Screw-drivers
Ratchet Breast and Hand Drills
Ratchet Bit Braces

Automatic Feed Bench Drills
Ratchet Tap Wrenches
Vises, Removable Base

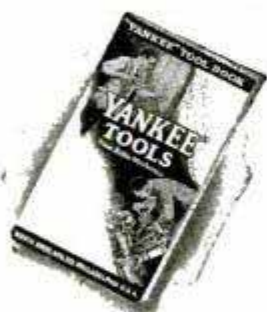
"Yankee" on the tool you buy means the utmost in quality, efficiency and durability

Dealers Everywhere Sell "Yankee" Tools

NORTH BROS. MFG. CO., Philadelphia, U. S. A.

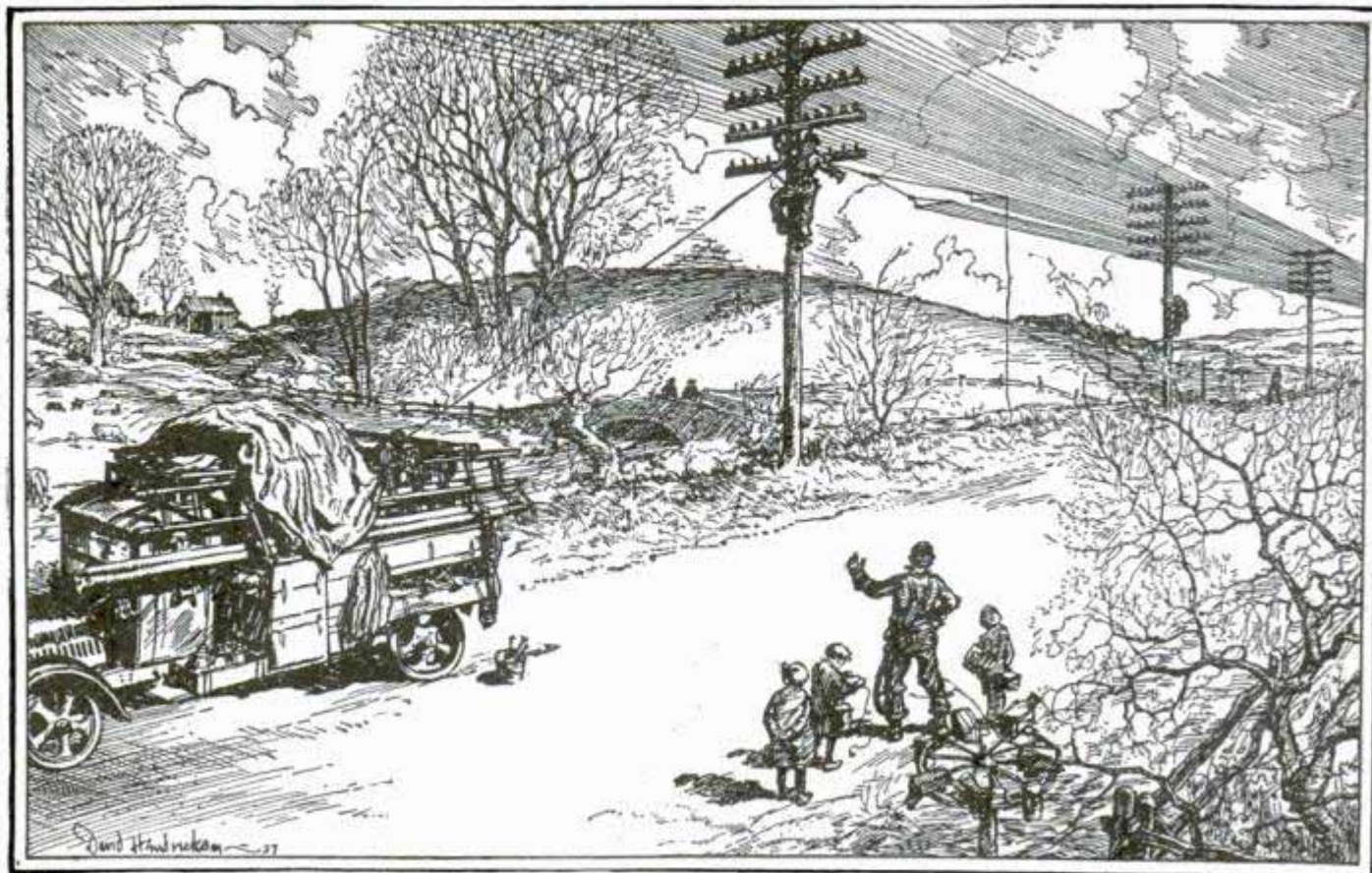
"YANKEE" TOOLS

Make Better Mechanics



FREE
New "Yankee"
Tool Book

This interesting little book is for all lovers of fine tools. It tells just what you want to know about all the famous "Yankee" Tools for making work easier and quicker. Write for your copy today.



Communication for a Growing Nation

*An Advertisement of
the American Telephone and Telegraph Company*



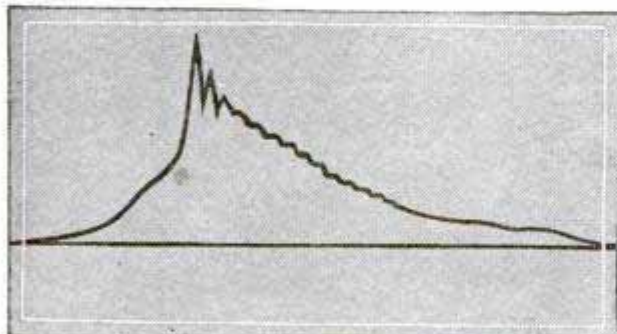
THE first telephone call was made from one room to another in the same building. The first advance in telephony made possible conversations from one point to another in the same town or community. The dream of the founders of the Bell Telephone System, however, was that through it, all the separate communities might some day be interconnected to form a nation-wide community.

Such a community for speech by telephone has now become a reality, and the year-by-year growth in the number of long distance telephone calls shows how rapidly it is developing. This super-neighborhood, extending from town to town and state to state,

has grown as the means of communication have been provided to serve its business and social needs.

The growth is strikingly shown by the extension of long distance telephone facilities. In 1925, for additions to the long distance telephone lines, there was expended thirty-seven million dollars. In 1926 sixty-one million dollars. During 1927 and the three following years, extensions are planned on a still greater scale, including each year about two thousand miles of long distance cable. These millions will be expended on long distance telephone lines to meet the nation's growth and their use will help to further growth.

The first picture of that "knock"

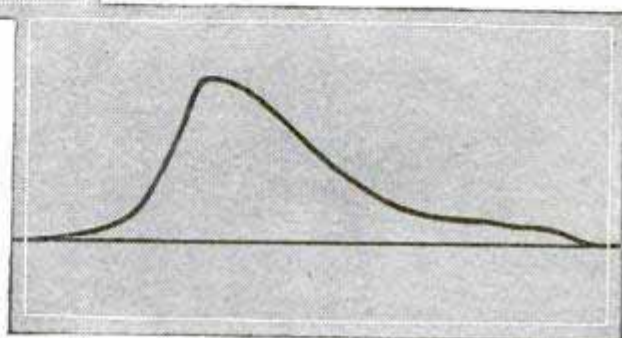


This is the "knock" in your motor

This shows photographically what occurs in the engine cylinder as carbon forms, when regular gasoline is used. The increased heat and pressure created by the carbon cause the gasoline to explode too quickly, with the result that there is an accumulation of high pressure heat waves which strike against the cylinder walls so violently as to produce an audible metallic sound. The bumps in the line are that "knock."

This is how "ETHYL" knocks it out

And this shows photographically what goes on in the same cylinder under the same conditions when regular gasoline is treated with "ETHYL" fluid. Note the absence of "knock-bumps"; the evenness of the pressure changes. The "ETHYL" fluid has neutralized the heating qualities of the carbon deposits and by maintaining the normal combustion rate of gasoline has turned the increased pressure due to carbon into increased power.



THESE PHOTOGRAPHS were made possible by a special instrument invented by General Motors Research Laboratories to find out what goes on in an automobile engine's cylinder when "knocking" occurs.

That invention led to the discovery that what you may call an "engine knock" or a "spark knock" is in reality a *fuel knock*. It is due to the tendency of a regular gasoline to explode too quickly as carbon forms and increases temperature and compression (pressure).

Having determined the character of "knocking," General Motors developed "ETHYL" fluid, a patented chemical compound which when added in very small quantities

to regular gasoline forms Ethyl Gasoline, the most effective "anti-knock" fuel yet known.

Ethyl Gasoline transforms carbon deposits from a liability into an asset. It produces more power on hills and heavy roads. It gives a faster "pick-up," reduces gear-shifting, lessens vibration and engine wear and tear; and saves the trouble and expense of carbon removal.

Ethyl Gasoline has increased the motoring satisfaction of hundreds of thousands of car drivers. It is destined to play a still more important part in the automobile history of the future. **TRY IT.**

ETHYL GASOLINE CORPORATION

25 Broadway, New York

ETHYL GASOLINE is now generally available throughout the United States and Canada through the following oil companies, licensed to mix "ETHYL" fluid with gasoline. The "ETHYL" trademark on the pump is your protection.

✓ ✓ ✓

Associated Oil Company ✓ Atlantic Refining Co. ✓ Beacon Oil Company ✓ Continental Oil Company ✓ Humble Oil & Refining Co. ✓ Imperial Oil Limited (Canada) ✓ Pennzoil Company ✓ Refiners Oil Company ✓ Spears & Riddle Co. ✓ Spokane Oil & Refining Co. ✓ Standard Oil Company (Indiana) ✓ Standard Oil Company (Kentucky) ✓ Standard Oil Company of Louisiana ✓ Standard Oil Co. (Neb.) ✓ Standard Oil Company (N. J.) ✓ Sterling Oil Company ✓ Union Oil Company of California ✓ Walburn Petroleum Co. ✓ Waverly Oil Works

ETHYL GASOLINE



CORONA

has helped this
salesman double
his earnings



TWO years ago his wife gave him a Corona for Christmas. Now he credits Corona with 100% increase in his monthly earnings. Here are just a few of the ways it has helped him.

- 1 Letters to customers he expects to see later in the week. Many times a buyer will hold over an order, knowing this man is on his way.
- 2 Little notes of appreciation for orders just received or a reminder of some point omitted during his call.
- 3 Reports to the Home Office about conditions in the territory, credits, etc. All his reports are neat, legible and concise. Several salary increases have been the direct result of this.

Think of the ways you could use Corona to make the most of your job, whatever it is! Mail the coupon now! You will receive, free, a valuable new book, *The Writer's Guide*.

L C Smith & Corona Typewriters Inc

Sales offices in principal cities of the world. Established 1903

Also manufacturers of L C Smith Typewriter, the Ball-Bearing Office Machine

Have you ever thought you would like to write short stories?

This free book contains a new easy method of building a dramatic plot.



L C Smith & Corona Typewriters Inc
512 E. Washington St., Syracuse, N. Y.

Without obligation to me, please send me a free copy of *The Writer's Guide*—and complete information about Corona.

Name

Address

I own a typewriter

I should like to know its trade-in value.

You can own this latest model CORONA

It's the finest Corona ever built—made by the world's pioneer manufacturers of portable typewriters.

A sturdy, dependable writing machine with full width (10 inch) carriage, twelve yard, two color, self-reversing ribbon, variable line spacer, everything you expect in an office machine. Yet it is compact, portable, easy to carry with you wherever you go.

Standard keyboard

Corona has the four-row standard keyboard used in all offices and taught in business schools. If you are accustomed to using a large machine, you will be at home on Corona. If you have never used a typewriter before, you'll find that it is easy to learn with Corona.

Buy a Corona on easy terms

A small deposit puts Corona in your home and then you can pay on easy, monthly terms just like rent. Your Corona dealer will gladly accept a used typewriter, any standard make, as part payment. You need not wait another day. Just look up Corona in your phone book and the dealer will send you one for free examination.

The coupon will bring you our latest literature. Mail it now.





Valspar Lacquer

dries in minutes—lasts for years

VALSPAR Lacquer dries *hard* within a few minutes after it's applied, yet the beautiful finish is more durable and beautiful than any other brushing material sold today!

What's more, anybody can apply Valspar Lacquer easily.

It's ideal for radio cabinets, furniture of all kinds, or any surface, wood or metal, about the home or shop. Moreover, Valspar Lacquer, unlike most lacquers, is waterproof and weatherproof. Hence it's just as good for outdoor as for indoor uses—even for boats!

Test it *yourself*. You will become a Valspar Lacquer fan.

Fascinating Colors

The Valspar Lacquer Colors are: Italian Blue, Java Brown, Coral Sand, Peacock Blue, Palm Green, Jonquil Yellow, Persian Lilac, Chinese Red, Nile Green, Oriental Green, Cardinal Red, Holland Blue, India Ivory, French Gray, Argentine Orange, also Black, White and Clear.

VALSPAR

BRUSHING

LACQUER

This coupon is worth 25 to 75 cents

VALENTINE & COMPANY, 460 Fourth Ave., New York

I enclose dealer's name and stamps—20c for each 45c sample can of colors specified at right. (Only three samples of Valspar Brushing Lacquer supplied per person at this special price.)
Print full mail address plainly.

Dealer's Name.....

Address.....

Your Name.....

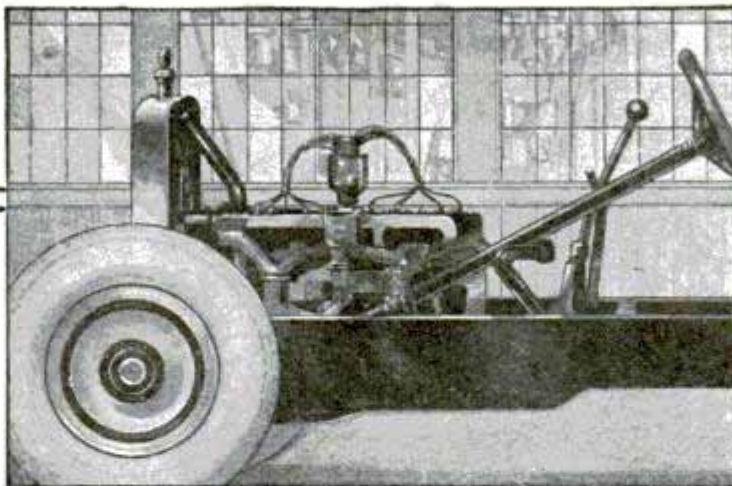
Address.....City.....

Send me these
Valspar Lacquer Colors

1.
2.
3.

Send Free Book.

P. M. 5-27



...to Less Than a Hair's Breadth

The measured thickness of a hair is about two thousandths of an inch—twice the tolerance allowed in grinding pistons for many fine automobiles.

Split hair accuracy is required in making the modern motor car. On the careful fitting of many

parts depends the proper performance of the complete machine.

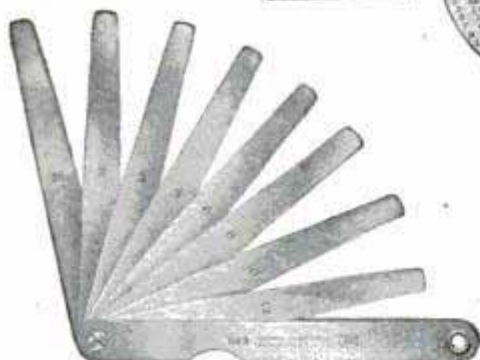
Every working day, in the hands of practical mechanics all over the world, Brown & Sharpe Tools are used in doing accurate work—work where a variation of one thousandth of an inch or less is all that is allowed.

B.S.



These accurate tools are described in our Catalog No. 30 which will be sent to you on request.

DEPT. P M
BROWN & SHARPE MFG. CO.
Providence, R. I., U. S. A.



BROWN & SHARPE TOOLS

"World's Standard of Accuracy"

AGENTS!



Science has finally produced it. An instantaneous metal cleaner—neither sloppy liquid nor messy paste. Dry magic floss. Touch it to nickel, copper or brass. The metal shines bright and clean instantly. No hard rubbing! Lightning Silver Cloth does same for Silverware. Lightning Furniture Floss instantly cleans and puts high lustre on Furniture. No liquid! Lightning Polishing Cloth is approved by Good House-keeping Institute. Agents making up to \$30 a day!

Makes a Sensational Demonstration!

Everybody Buys These Products. Housewives buy the Lightning Silver Cloth and Furniture Floss. Autoists buy Lightning Polishing Floss. Sell all three to stores and offices in big quantities. Nothing else like them. Sure big, quick MONEY GETTERS.

Sample Free! Exclusive territory. Real cooperation. Triple profit. Answer this ad at once. Make big money. Easy! Quick! Don't delay. Write NOW! FREE test sample and proposition by return mail.
D. T. LIGHTNING PRODUCTS CORP., 1773 Greenleaf Ave., Chicago

EXPERIENCE UNNECESSARY

AMAZING DISCOVERY ABOLISHES METAL AND FURNITURE POLISH

Imagine! Touch tarnished articles with a Lightning Polishing Cloth or Floss and you make them bright as new. Demonstrations positively astonishing! Every one a sale! Agents collect real money on every call.

CATCH FISH EASY WAY!



Catch Fish, Lobsters, Eels, Crabs etc. in large numbers. Also Skunks Weasel, Mink, Muskrats and many other fur-bearing animals, with my New Folding Galvanized **STEEL WIRE TRAPS**. They catch them like a fly-trap catches flies. Made in all sizes. Big money makers for trappers and fishermen. Write for Price List, **Free Trap Offer**, and my **Free Formula** for making best bait known for attracting fish and animals. **J. F. GREGORY, Dept. 131, Lebanon, Mo.**

MOVIES AT HOME



Many models of genuine MOVIE MACHINES, some as low as \$3.75, all using standard size big theatre films. Our stock of films is the most complete and lowest in price—with an exchange service. Films of leading stars and religious subjects are available. **DON'T DELAY. WRITE FOR FREE INTERESTING CATALOGUE NOW!**

PARAMOUNT MFG. CO.
Dept. 1371 BOSTON, MASS.

How to avoid "orphans"

This new free book will tell you this and many other valuable things which are important to know in buying a used car—

*Send for it
today!*



DO you know how to tell what year any used car was built? Do you know what is meant by an "orphan" car? Do you know why reputable dealers ordinarily turn the speedometer back to zero? Do you know what special points to check in examining a used car?

How should you protect yourself in buying a used car from a friend?

These and many other questions that any buyer of a used car should know are fully and clearly answered in this free book, "How to Judge a Used Car." It will give you valuable information based on the long experience of hundreds of experts in buying used cars for Studebaker dealers. They tell you what to look for and what to avoid—sound, practical advice that will save you time and money. Send for it *now!*

If your dealer lives up to this **PLEDGE** you can safely buy a Used Car from him without reading the book. But before you start shopping around you had better send in the coupon for your copy of "How to Judge a Used Car."

Pledge to the Public on Used Car Sales

- 1 Every used car is conspicuously marked with its price in plain figures, and that price, just as the price of our new cars, is rigidly maintained.
- 2 All Studebaker automobiles which are sold as **CERTIFIED CARS** have been properly reconditioned, and carry a 30-day guarantee for replacement of defective parts and free service on adjustments.
- 3 Every purchaser of a used car may drive it for five days, and then, if not satisfied for any reason, turn it back and apply the money paid as a credit on the purchase of any other car in stock—new or used. (It is assumed that the car has not been damaged in the meantime.)

To the Public: We pledge adherence to the above policy in selling used cars.

Your Studebaker Dealer

THE STUDEBAKER CORPORATION OF AMERICA
Department E-72, South Bend, Indiana
Please send my copy of valuable free booklet, "How to Judge a Used Car."

Name _____
Street _____
Town _____ State _____

STUDEBAKER

Seventy-five years young



To Satisfy Yourself

Let us show you that the claims men make for this unique shaving cream are true—accept 10-day tube to try

GENTLEMEN:

You've heard men advance some pretty broad claims for Palmolive Shaving Cream. Claims which make your present favorite take second place.

Let us show you that the claims men make for this unique shaving cream are true—accept 10-day tube to try.

Made by the makers of Palmolive, the world's leading toilet soap, 60 years of soap study stand behind it.

Read these 5 advantages

1. Multiplies itself in lather 250 times.
2. Softens the beard in one minute.
3. Maintains its creamy fullness for 10 minutes on the face.
4. Strong bubbles hold the hairs erect for cutting.
5. Fine after-effects due to palm and olive oil content.

Just send coupon

Your present method may suit you well. But still there may be a better one. This test may mean much to you in comfort. Send the coupon before you forget.

THE PALMOLIVE COMPANY, (Del. Corp.)
CHICAGO, ILL.

10 SHAVES FREE and a can of Palmolive After Shaving Talc

Simply insert your name and address and mail to Dept. B-1318, The Palmolive Company (Del. Corp.), 3702 Iron Street, Chicago, Ill. Residents of Wisconsin should address The Palmolive Company (Wis. Corp.), Milwaukee, Wis.

(Please print your name and address)

3511



**Easy
Instant
Starting**
—the keynote
of outboard
satisfaction

AND Elto start-
ing is easy in-
stant starting in the truest sense —
actual quarter turn starting — an effort-
less flip of the flywheel. Thousands of
users say that this is the most vitally
important feature in an outboard motor!
Your next motor should
have it—and it should have
the advantages of safe
rudder steering, trouble-
proof Propello-Pump, and
the sturdy construction
that means long service life.

Send now for the Elto Catalog.

ELTO OUTBOARD MOTOR
CO., Ole Evinrude, President
Mason St., Dpt. AA Milwaukee



**The
Super Elto**
Starts with a quarter turn



**Sell LIFE
PROTECTION**

**\$50 to \$100 A
Week
to Agents—Amazing**

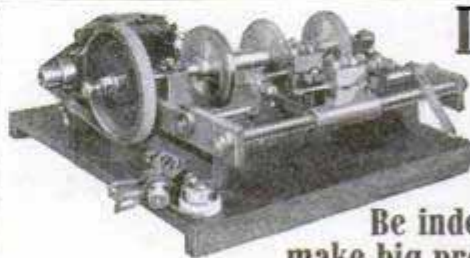
Anti-Glare Device for Automobiles

prevents loss of life and makes big money for
salesmen. Motorists buy on 30-second dem-
onstration. Treated by secret process. Shields
the eyes from dazzling head-lights. Also used
by day as a rear-view mirror. Unique, mys-
tifying. Big season now. Write for details of
our generous trial offer and sensational money-
making plan with special discount prices to
agents. No obligation. Address

THE LEE SEE CO., Dept. 85, Kewaunee, Wis.

READ

Rhanney sold
108 in less than
a week — Bal-
ance made \$40
in a day — \$200
in a week — Gris-
singer sold six
first fifteen min-
utes. It's a win-
ner for salesmen.



**Don't Be
a
Slave**

Be independent and
make big profits with the
BEISSER KEY MACHINE

You can start a business of your own, no experience necessary.
Only machine that will cut ALL KINDS of keys perfectly.
No hand filing required. Also first keys by number without
need of taking locks apart. Write Today for Full Particulars.

BEISSER KEY MACHINE CO.
407 Fort Street, East Detroit, Michigan

Remington

The PORTABLE

is your pal. It is always ready to help—at any hour—under any conditions. Faithful, reliable, willing, it responds to every need—helps you at every turn. Whenever there's personal writing to do, call on the Remington Portable.

Smallest and lightest portable with standard keyboard. (Weight only 8½ pounds, net, and the carrying case is but 4 inches high.) Incomparable for strength and durability. The recognized leader—in sales and popularity—a Remington through and through.

Send for our booklet, "For You — For Everybody," to Department 12.

Remington Portable can be purchased on terms as low as \$5 monthly.

REMINGTON TYPEWRITER COMPANY
Branches and Dealers Everywhere
374 Broadway, New York



Typewriters

A Machine for every purpose

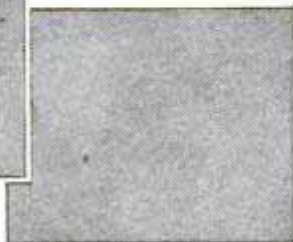
Remington-made Paragon Ribbons & Red Seal Carbon Papers always make good impressions.



New Life for OLD WALLS and ceilings



Before using Rutland
Patching Plaster



After using Rutland
Patching Plaster

IT'S so easy now for you to make cracked walls or ceilings as good as new!

You just mix Rutland Patching Plaster with a little water, and fill the crack or hole. The patch will be as lasting as the wall itself.

Rutland Patching Plaster will not crack, crumble or fall out. It will not shrink as plaster of paris shrinks. It's easier to use than plaster of paris because it does not get hard or "set" instantly.

Paint, wall-paper and hardware stores sell it. If your dealer hasn't Rutland, we will mail a package direct and you can pay the postman 30c plus postage. Rutland Fire Clay Co. Dept. V-3, Rutland, Vermont.



Rutland Patching Plaster



STOP FORD CRANKSHAFT END-PLAY!

C-A ADJUSTABLE BEARING corrects and prevents end-play without removing motor. Eliminates many troubles. Easy to install—simply drop pan. Only \$3.75. Ask your dealer or sent prepaid by ADJUSTABLE BEARING CO., Dept. P, 405 Virginia Ave., Indianapolis, Ind.

Bodies of Rare Beauty for Fords

At Factory Prices!

Write for circular A-2 showing this De-Luxe Model and others.

\$22.75 AND UP



Sport Factories AURORA, ILL.

Own Your Own BUSINESS and Make Money!

By the Nestler Plan, any ambitious man can run his own profitable tire-servicing business. No previous tire experience required. Nestler methods and equipment also bring big profits to vulcanizers and garages. Small investment; large returns,—for the Nestler operator has an exclusive, up-to-date service that every car-owner needs.

To Every Car-Owner
Don't discard that "worn-out" tire! Take it to a Nestler man. The Nestler Rubber Fusing Process adds thousands of miles of new life to old tires. It is the 100% efficient, economical method of servicing tires. Write for address of your nearest Nestler Station.

WRITE TODAY for free book "The Nestler Plan."
It tells all about the amazing Nestler method of servicing tires and making money in a sound business of your own. NESTLER RUBBER FUSING CO., INC. Dept. 35 245 W. 55th St., New York, N.Y.

YOU PAY TWICE AS MUCH FOR GASOLINE WITHOUT QUICKSTART

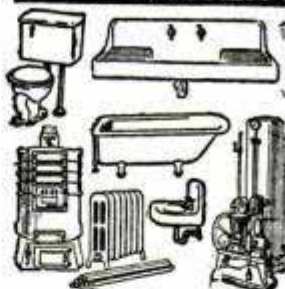
Try it Free!

W. A. Dorwart, Nebraska, writes:

"Regarding the Quickstart, I think it is the best device I ever saw. On a trip the other day I made over 120 miles on 2 gallons of gas. I was sure surprised. Of course, I can't get this every day but I know that I more than double my former mileage and can start my car in any weather right away."

Liberal Drawing Account and Traveling Expenses Guaranteed to Distributors. Write QUICKSTART MFG. CO., Station C., Dept. 805-G, Omaha, Nebraska

PLUMBING - HEATING WATER SYSTEMS



SAVE UP TO 40%

Wonderful bargains—everything guaranteed. Full line of plumbing and heating supplies. Hot water, steam heating plants and fixtures and water systems at big savings.

Install Them Yourself

Finest materials all brand new and perfect. Tell us your wants and mail us a rough sketch of your rooms.

SEND FOR PRICE LIST

B. KAROL & SONS CO. 800 S. KEDZIE AVE. Dept. 20 CHICAGO



\$25.00 PAID DAILY

FREE SLICKER for WORKERS for just a little work on your part **WOMEN, MEN WANTED**

It's Easy. You show raincoats. We deliver and collect.

WRITE FOR FREE OUTFIT

Super Built Co., Box 453, Desk 2, Chicago, Ill.

MOTORCYCLES



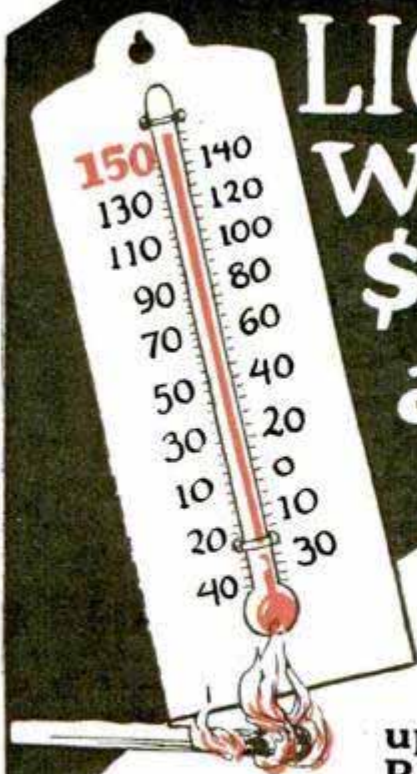
Price \$10 and up purchased through our Co-Operative Plan for as low as \$1.00 down and \$1.00 per week

Indians Harley-Davidsons Ace Henderson and Cleavelands

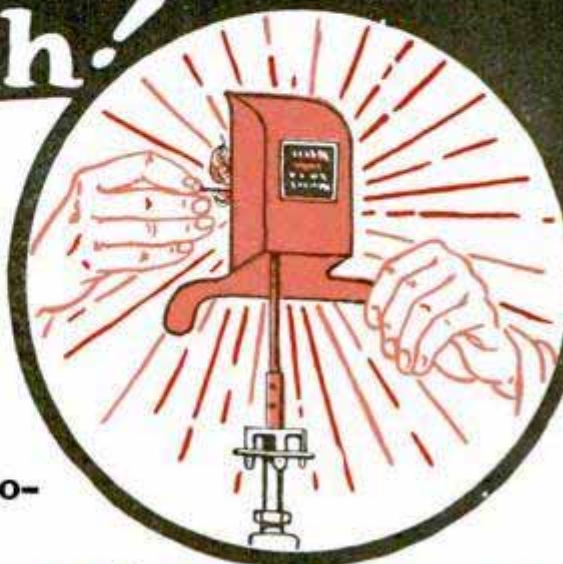
Send ten cents for Bulletin A.

Motorcycles shipped all parts of the world
WALKER-INDIAN CO., 188 Mass. Ave., BOSTON

LIGHTING MATCHES WILL MAKE YOU \$300 to \$2500 a month!



Just as
heat sends
the mercury of
your thermom-
eter shooting
up—so Ford Mileage
Records reach new
heights with the Blancke Thermo-
static Carburetor Control.



The Same Thermostatic Principle Works Both!

Any thermostatic substance expands with heat and contracts again when cold. On this simple principle the Blancke patented Thermostatic Carburetor Control made Fords run 43.8 miles on one gallon in Official Public Test. F. W. James of Niantic, Conn. gets 49.3 miles on 1 gallon. Reports from 351,272 public and private tests show average of 32 miles per gallon, breaking world's record for average mileage.

Try Out This Sensational Sure-Fire Demonstration

Heat instantly expands the coil of thermostatic metal in the Blancke Control, and the needle valve on the carburetor slowly turns, admitting only the gas necessary for efficient operation. Cooling, it turns again, just as a faucet is turned on and off, assuring quick starting. It does this automatically—accurately—insuring maximum mileage and power from every atom of gas.

Get Agents' Prices—150% Profit Guaranteed

New Blancke plan combined with amazing demonstration and guaranteed results makes Blancke Control greatest agent's selling success of recent years. Phillips Vickery sold 108 Blancke Controls in 1 day (Profit \$324.00). R. K. Waite, ordered 1000 in 1 month. (Profit, \$3,000.00.) Wires "Get ready another 2,000" Every mail brings similar astounding reports.

You don't need experience to sell the **Blancke Control**. Guaranteed results speak for themselves and fascinating demonstration sells for you.

Makes Starting Easy

In wintriest weather and prevents too rich a mixture in warm weather. Insures proper combustion at all times. Eliminates frequent use of choke when getting under way. You can't help making big money with an article of such remarkable merit, backed by a big national advertising campaign and endorsed by well known companies all over the world.

Get 1 Free to Introduce

Also Blancke Plan that guarantees 150% profit. Starts you without capital in real business of your own, pays you \$300.00 to \$2500.00 and up each month, and gives user Agent New Ford car FREE by time his present one is worn out. Exclusive territory. Sales Guaranteed. Start to make real money—beginning NOW! Send coupon today for sample control and great Distributors plan.

BLANCHE AUTO DEVICES CO.

157 E. Erie St.
Dept. 805-G CHICAGO

Cadillac and Deleco Light now use as standard equipment Thermostatic Carburetor Control under Blancke License. You can get no better proof of merit than this.

**SALES
Guaranteed**
Mail Coupon Now

Blancke Auto Devices Co.
157 E. Erie Street,
Dept. 805-G, Chicago, Ill.

Gentlemen: I should like to get a Blancke Control Free to introduce in my community. Also send details of amazing new Guarantee Plan by which I can make from \$300 to \$2,500.00 a month profit and get a new Ford Free by time my present one is worn out.

Name.....

Address.....

City.....State.....

**\$15 a Day
Guaranteed
to Distributors**

"Be the hit of the party with this Lyon & Healy Sax"

says Reginald Denny



"Don't envy the other fellow his good times and popularity. Here is a saxophone you can learn to play quickly and easily. Take my advice and get one!"

Reginald Denny

YOU who have always wanted to play some kind of musical instrument—pay attention to Reginald Denny's advice. Learn to play the most popular instrument of all—a saxophone! Here is your chance to win pleasant evenings, new friendships, extra pocket money for yourself. If you can whistle a tune you can play this new Lyon & Healy Sax.

Amazing Beauty of Tone!

You learn quickly because we have simplified the fingering, made it easy for you to play,

easy to produce full, rich tones. That's why amateur musicians like Denny prefer the new Lyon & Healy. Leading professional players in famous orchestras are delighted with its accurate adjustment, improvements in key action for hair-trigger finger work, exactness in pitch and resonant and mellow tones. Completely made in Lyon & Healy's own factories and guaranteed by this, the most famous music house in the world.

Easy Payments!

Learn how easy it is to purchase one of these professional instruments on our special time payment plan. Many write they pay for theirs out of extra pocket money earned by playing as they pay.

Free Instructions! Free Trial!

Use coupon for details of six-day, Free Trial, Free Lessons Offer. Teaches you to play tunes without learning written music. Not obtainable anywhere else. Free, with a Lyon & Healy Sax.

Or play one of these?

Lyon & Healy Trumpet, "Conical Bore" throughout. Easier to play. The most remarkable professional instrument ever produced. In silver with gold bell. \$110.00 in case. Washburn Banjo, the most musical, resonant, far-reaching (by test) professional banjo made. \$60 to \$500.



Lyon & Healy Continuous Conical Bore Trumpet



Washburn Tenor Banjo

Lyon & Healy

Everything Known in Music
77 E. Jackson Boulevard, Chicago

Mail the Coupon Today!

LYON & HEALY, Factory Sales Division
77 E. Jackson Blvd., Chicago
Send Free your new Saxophone Book with details of Free Trial Offer, "Easy to Play" plan and Free Instructions.

Name _____
Street _____
City _____ State _____
Instrument _____



Save more than ever
This 6 Room Bungalow **\$1493**
NOW FREIGHT PAID
Price includes everything complete—lumber cut-to-fit, FREIGHT PAID to your station.

New Low Prices Our customers' claim average savings of 47% over local prices. This year reduced prices make possible still greater savings.

We Loan You Money to Build

We ship you any home you select, ready to erect, and ADVANCE YOU CASH to help you build. You pay us in small amounts monthly, just as you pay your rent—and your rent money is saved instead of spent. Send 25c in coin today for beautiful Color Book of Sterling Home Plans and you can be living in a home of your own a month from now.

COLOR BOOK OF Sterling Home Plans 25c

INTERNATIONAL MILL & TIMBER CO.
754 S. Wenona Ave. BAY CITY, MICH.

LIGHTING FIXTURES

Ready to hang

Direct from the manufacturer. Completely wired, including glassware. Send for new catalogue No. 28. Just Reduced Prices. Special Proposition to Dealers.

Erie Fixture Supply Company, Inc.
Station A ERIE, PA.

Your Coat and Vest Can Be Matched with New Trousers

3/4 of the price of your suit is in the coat and vest. Why not get full value out of them by replacing the worn out pants with a new pair. Send us sample (small piece from seam or the vest) and we will show you how close we can match it. All tailored to measure. Prices range from \$9.00 to \$15.00 according to quality.

Enclose return postage if vest is sent.

ACME PANTS MATCHERS
Dept. BE 14, 20 W. Jackson, Chicago

I'll Pay You \$40 A DAY!

To Show My Mysterious Cigarette Lighter to Men

Quick, easy profits for you with this amazing invention. Lights cigarettes and cigars in strongest wind. New principle of ignition. Does work of expensive lighters, but sells for only 50c. Guaranteed for 10 years. Elmers sold 48 in one day. Johnson cleaned up \$63.00 in two days. No experience necessary. Work full or spare time. Send \$3.00 for dozen lighters or 50c for agent's sample. You make 100% clear profit. Satisfaction guaranteed or money back.

MASTERLITE MFG. CO., Desk E-23
110 E. 23rd Street NEW YORK CITY

I Want to send you a Santa Fe Special Watch

for your
Examination
Approval

21
Jewels



Watch Sent on 30 Days Free Trial

**Send No
Money**

In addition to our New Low Price, I will send for your approval one of these Standard Watches, guaranteed for a lifetime of satisfactory service, not only by the Santa Fe Watch Company, but by the Great Illinois Watch Factory. They are found in the pockets of men in the service on every railroad in this country. Senators, Congressmen and Governors keep their official appointments by "Santa Fe Special" time. Army officers and Privates carried them all through the Greatest War in history—thousands of these splendid watches are in use all over the World. If you want one on my liberal new LOW PRICE PLAN, you had better write for my Free Watch Book today and make your selection without delay. I will send the Watch for you to see WITHOUT ONE PENNY DOWN—I will even allow you to wear the Watch 30 days FREE—then sell it to you on a binding money-back guarantee.

Why Not Own A 21 Jewel Watch

You will never miss the few cents a day that will make you own one of these watches—SEND FOR WATCH BOOK—illustrating in beautiful colors hundreds of designs and combinations in cases in the POCKET WATCH, MEN'S STRAP WATCH and LADIES' WRIST WATCH. You can have your name or monogram and any emblem you may desire engraved in the Case to suit your own ideas.

New Case Designs

I want you to see the new models and wonderful case design in the Santa Fe Special, the Santa Fe Mogul, the Santa Fe Strap Watch and the Petite Santa Fe Princess Watch. No matter what your choice of a watch may be there is a Santa Fe Watch to please you. Send coupon for our beautiful FREE catalogue showing hundreds of designs and models in watches and newest creations in Diamond Rings and Jewelry.

Mail

Coupon

for Beautiful

FREE Watch

and

Diamond Book

SANTA FE WATCH COMPANY
56 THOMAS BUILDING TOPEKA, KANSAS
(HOME OF THE GREAT SANTA FE RAILWAY)

I Santa Fe Watch Company,
56 Thomas Building, Topeka, Kansas.
Please send prepaid and without obligation your Watch Book Free,
explaining your "No Money Down" Offer on the Santa Fe Special
Watch.
Name.....
Address.....
City.....State.....

FREE A limited offer!
With every Santa
Fe Special,
a beautiful gold
chain or strand of exquisite
pearls. Write today.



JAPANESE ROSE BUSHES

The Wonder of the World

Japanese Rose Bushes bloom all the year round. Just think of it. Six weeks after planting the seed, the plants will be in full bloom. It may not seem possible, but we positively guarantee it to be so. They will bloom every ten weeks, Summer or Winter, and when three years old the bush will be a mass of roses, bearing from five hundred to a thousand roses on each bush. The flowers are in three shades—white, pink, and crimson. The plants will do well both in and out doors. We guarantee at least three bushes to grow from each packet of seed. Price, 10c packet, 3 pkts. for 25c postpaid.

Chinese Fragrant Tree Fern



Just introduced; noted for its rapid growth. An exceptionally pretty ornamental plant. Foliage is rich dark green. Forms grand pyramidal bushes about 6 feet high. Branches very desirable for decorative purposes, wreaths, etc. Seeds 15c pkt., 3 for 40c.

Weather Plant



NATURE'S WEATHER PROPHET
By mysterious changes that take place, this remarkable plant accurately forecasts the weather many hours in advance. Will grow anywhere all the year around. An interesting house plant. Bears large, fragrant, pink, butterfly shape flowers. Seeds, 15c packet, 3 for 40c, postpaid

GROUND ALMONDS

Amazingly Prolific—Easily Grown From Seed
The Ground Almond has a flavor that is MOST EXCELLENT, resembling the coconut. The meat is snow white, covered with a shell or skin of brown color. It grows close to the surface and anything from 200 to 300 Almonds may be expected from a single nut. There is no trouble whatever in growing anywhere and in any kind of soil. May be planted any time, and in eight or ten weeks from time of planting you will have an ENORMOUS CROP of the MOST DELICIOUS ALMONDS YOU EVER TASTED. Seeds 15c Pkt.



Perfume Plant

Blooms only at night, giving forth the most delightful scented fragrance for quite a distance. Causes much comment. For house or garden. Also valuable because of rare perfume made from it. SEEDS, 10c pkt., 3 for 25c.

Calabash or Pipe Gourds

A luxuriant and rapid growing climber; thrives anywhere. Produces the ornamental gourds from which the famous African calabash pipes are made. Grow this interesting vine and make your own. Seeds, with instructions, 15c pkt., 3 for 40c.

Mammoth Peanuts

Peanuts can be easily cultivated. Their culture is very simple and exceedingly interesting. Mammoth Peanuts grow to an astonishing size. It is a good producer, very prolific, and the giant nuts have a thick, heavily ribbed protecting shell. The plant is very attractive, the leaves being of odd shape and a handsome green shade, tinted through the center with white. You will derive much pleasure cultivating this interesting species. Seeds 15c pkt., 3 pkts. for 40c.

Musk Plant

A universally admired favorite for house, flower garden or greenhouse. A very fine house plant. Lives for years. Is of the sweet scented variety, giving forth much fragrance. Also valuable on account of the perfume that can be made from it. Seeds 15c pkt., 3 for 40c.



Kudzu Vine

Most rapid growing vine known. Will grow 20 feet in one week. Luxuriant foliage, lovely purple flowers, very fragrant. Nothing to equal it for shade purposes and quick growth. Seeds 15c packet, 3 for 40c.

Japanese Climbing Cucumber



Unusually strong and vigorous growing vine. Attains twice the size of ordinary varieties. Grows readily on fences, poles, trellises, etc. One hill will keep an entire family supplied all summer. Seeds 15c packet, 3 for 40c, postpaid.

GIGANTIC NEW GUINEA BUTTER BEANS

THE NEW EDIBLE VEGETABLE WONDER
Grows to an astonishing size, the Beans measuring from 3 to 6 feet long, and weighing anything from 10 to 16 lbs. and even more. One Bean is sufficient for a family for several meals. Very palatable and rich in nutritious materials. The delicate Buttery Flavor is much appreciated. The Vines are easily grown, very prolific, and a most welcome and valuable adjunct to your garden. Try them: you will find them the most delicious vegetable you have ever tasted. Imported direct. Unobtainable elsewhere. Sample package of Seeds with full directions for cultivating and cooking. 25c, postpaid.

Yard Long Bean



Produces enormous crop of long, slender, round pods, of excellent quality for snap beans. Pods grow from 2 to 5 feet in length. Very tender and fine flavor. The vines are rampant growers; an interesting curiosity. Seeds 15c pkt., 3 for 40c

THE REMARKABLE FIREFLY PLANT



A Vine that Blooms at Night
Fills the Atmosphere with Fragrant Aroma

One of the most rapid growing vines known. Under favorable conditions this vine has been known to grow OVER 25 FEET IN A SINGLE WEEK. In a very short space of time indeed the Vine has climbed to a great height, and is covered with IMMENSE FLOWERS, from 5 to 7 inches in diameter. It is, indeed, a great novelty, for, unlike other plants, the flowers OPEN IN THE EVENING, and remain open until about noon the following day. In dull weather they will remain open all day. It is a most INTERESTING SIGHT to watch the opening and closing of the flowers as the clouds appear and disappear. As the flowers open they give forth the most DELIGHTFUL AROMA, and the whole atmosphere around is full of scented fragrance. It is always the object of favorable comment, and much curiosity is aroused by people passing at night time as to the cause of the charming aroma, frequently stopping in an endeavor to satisfy their curiosity. PRICE, 19 CENTS packet, two packets for 35 CENTS, POSTPAID. JOHNSON SMITH & CO.

The Great Wonderberry



A luscious berry that may be grown and ripened from seed in any soil or climate in 3 months. The flavor is fine and unsurpassed for eating raw, cooked, canned or preserved in any form. The fruit is blue-black in color, and tastes like a luscious, rich blueberry. One bush will produce an enormous amount of fruit, yielding great masses of rich fruit all Summer and Fall. Packet, 10c, 3 pkts. for 25c, postpaid.

Bush Musk Melon



A vineless Musk Melon, grows in bushes, and thus can be cultivated in the smallest garden. The fruit is of the popular "Jenny Lind" type, but larger, averaging 8 inches in diameter. The flesh is very deep, edible almost to the rind and is colored light green, flushed with salmon toward the center. The quality is superb, lusciously sweet and juicy. Packet of seeds, with full directions for culture, 15 cents, 3 packets for 40 cents, p.p.d.

The Great Umbrella Palm

Easily Grown From Seed Winter or Summer
The Japanese Umbrella Palm is a semi-aquatic plant. It is easily grown from seed either in a bowl of water or in very damp soil. Probably the most usual, as well as the most interesting method, is to cultivate the plant in a bowl or jardiniere filled with water, with two or three inches of good garden soil at the bottom. The seeds soon commence to germinate, and the plant shoots up stems two to three feet high and rapidly assumes a most pretty palm-like appearance, as shown in the engraving. The tops of the stems are surmounted by a whorl of umbrella-shaped leaves, of a waxy appearance. We will send a package of this seed, with full instructions for culture, for only 15c or three packets for 40c postpaid.

Butterfly's Own Bush



This plant is a veritable refuge or haven for butterflies, and it attracts all the most beautiful types of butterflies to the neighborhood. Bees, too, are very fond of it. It is a pretty plant bearing perfectly double flowers, ranging from white to rich crimson, deep red and pink, lilac and other delicate shades. Packet 10 cents, 3 for 25 cents postpaid.

CROWN OF THORNS



A very curious clover-like plant, can be cultivated indoors or outdoors, the three red blotches on the leaves representing the three wounds of Christ. Has curious thorny seed ball; if loosened at tip the ball is found to consist of a long prickly-edged band wound spirally around the seed cluster, giving the plant its name. Seeds 15c packet, 3 for 40c.

"Wong-Bok" Chinese Cabbage



Novelty from China and should be grown in every garden. Seems to be a cross between Celery and Cos Lettuce. Flavor is more mild than any other cabbage. Can be served on the table and eaten raw or cooked like cabbage, spinach or lettuce or made into salad. Grows very rapidly, easy to cultivate. You can create quite a sensation by cultivating this remarkable novelty. Seeds, 15c packet, 3 pkts. for 40c.

FAMOUS MEXICAN FIREFLY PLANT



Beautiful hedge plant, grows 2 to 3 1/2 feet high and resembling a closely clipped evergreen. The globe-shaped or pyramidal bushes are close and compact, and of a pleasing light green color. May be grown singly or in the form of a hedge or background. In early autumn the whole bush becomes carmine or blood red, hence the name of Mexican Fire Plant, or "Burning Bush," as it is sometimes called. Selected Seeds, 10c

Asparagus Sprengeri



The best plant for hanging baskets. Masses of rich, gleaming foliage droop in a very graceful manner. The foliage when cut for decorative purposes will last for weeks in water. The seed pods are very pretty red berries adding to its beauty. Packet, 25c, 3 pkts. for 65c postpaid.

TREE OF HEAVEN



This splendid ornamental tree is a native of China, and is called the Tree of Heaven, on account of its great beauty. Very hardy, thrives in any soil, no matter how poor, and grows from 6 to 10 feet high from seed the first summer. The leaves are from 5 to 6 feet in any length, giving it a grand appearance. Nothing outside the tropics can rival it for lawn decoration. Large panicles of bloom, followed in season by great clusters of colored seed pods, make the tree a continual thing of beauty. Packet, 15c; 3 packets 40c

SURPRISE FLOWER GARDEN



Over Hundred Varieties of Mixed Flower Seeds
MANY RARE AND CURIOUS NOVELTIES
An Abundance of Flowers Assured Throughout the Season
A mixture of easily grown annuals that bloom very soon after sowing and vary in their time of blooming. Those who cannot give the constant care necessary for finely arranged flower beds will be delighted with the Surprise Wild Flower Garden. Will prove a continual surprise and pleasure, as new varieties and the old garden favorites flower successively throughout the season. There are over a hundred varieties of seeds. Many of the plants may be taken inside as house plants and will bloom during the winter. Fine for children, also teachers for school gardens. Packet, 15 cents, three packets for 40 cents, J. S. & CO.

JOHNSON SMITH & CO.,

Dept. 808, RACINE, WIS.

You can now own a Typewriter!



Be up-to-date—know the pleasure and convenience of having one in your own home. You'll be amazed at the uses every one in your household will find for this real Underwood typewriter. Every member of the family will use and enjoy it! Don't send a cent—but do get our big special offer—our valuable book on typewriters and typewriting—FREE.

Any One Can Learn to Operate a Typewriter

You can learn to write on this standard-keyboard machine in one day, it's so simple that even a child can use it. A week after the expressman has brought it, you'd feel LOST without it. A trial will PROVE it—and doesn't cost you a penny!

Special Free Trial Offer!

We don't want a penny now. Nor any money at all unless this proves the typewriter bargain of your life. The trial is FREE. If you buy, our easy terms make it a pleasure to pay. There's no excuse now, for not owning a typewriter—and the finest make! We include all tools, a cover, etc., all complete, all ready to write. Write us now. Deal direct; we are the largest factory of the kind.

Our plan gives you the opportunity of a thorough trial before you buy. You run no risk whatever. You start to pay for your typewriter AFTER you have found it the only machine for you! But get the facts before this lot of machines is all in use. Clip the information coupon before you turn the page. It will pay you! Note the very useful book you will receive free! Write for full particulars at once.

The Greatest Typewriter Offer Ever Made

If you know typewriters, you know the perfect work and the ease and speed of a Shipman-Ward rebuilt Underwood typewriter. New machines are guaranteed for only one year; WE GUARANTEE EVERY ONE OF OUR MACHINES FOR FIVE YEARS! If you have never owned a typewriter, start with the finest! You can try this one at our risk. But, the time to act is NOW. Don't miss out on this present bargain offer whereby you can get this genuine Underwood at a big savings. Don't do longer without the convenience of a typewriter.

FREE! Get our catalogue free; lowest prices and terms. A manual free, too; valuable instruction for learning rapid typing, useful pointers for all who use a typewriter, business forms, social correspondence, work for others, etc.

Clip Coupon NOW!

MAIL TODAY!

Shipman-Ward Manufacturing Company,
2125 Shipman Building, Chicago, Illinois.
Please send me your big Free Trial Plan and Typewriter Book,
together with your special offer on prices, terms, free course in
Touch Typewriting and also how I can make money with this type-
writer; without obligation. This is not an order.

Name.....

Street or R. F. D.....City.....State.....





**"Mine's
a Maydole, too"**



(The old timer)
"There's a real hammer. It'll last me as long as I can swing it."

(The apprentice) "Mine's a Maydole, too. I noticed most of you fellows had 'em so I remembered to look for the name stamped on the head."

(The old timer) "Well, you made no mistake. The head on that hammer is press-forged of tool steel, and the handle is real, second-growth hickory, air-dried and put on there to stay."

(The apprentice) "It sure has a peach of a hang. I'm as proud of it as I am of the most expensive tool in my kit."

Since 1843, the Maydole Hammer has been as fine as human skill and experience could produce. Your dealer sells the genuine Maydole. Look for "D. Maydole" on the head.

Write for free copy of our interesting and valuable Pocket Handbook 23 "L".

YOUR HAMMER SINCE 1843
Maydole
Hammers

The David Maydole Hammer Co., Norwich, N.Y.

768



Wrenches *that get there!*

Crescent Wrenches get jobs done quickly because they are designed to reach into awkward places, to take hold firmly, and then to change adjustment easily, quickly and accurately for the next job.

Get them at hardware or accessory dealers.

CRESCENT TOOL COMPANY

210 Harrison St., Jamestown, N. Y.

CRESCENT
and Smith & Hemenway
TOOLS

This BOOK  **Sent Free**

Get this new, valuable catalog, describing amazing tests of "Cornwell" Tools. **MAIL COUPON TODAY**

CORNWELL Quality Hand-Made Tools are guaranteed superior to any other tools you can buy. Catalog illustrates, describes and prices full line of automotive service tools, explaining unbelievable tests which no other tools will stand.

CORNWELL Hand-forged Tools Accomplish Amazing Results

Remarkable results are accomplished every day with "Cornwell" Tools—They do things that no other tools will do.—"Cornwell" Tools are strictly hand-forged from the very highest grade Chrome Molybdenum Steel produced under our famous "Cornwell" formula—They are forged, heat treated and hardened and tempered in oil—Not drop forged and case hardened.

Read About All These Amazing Tests

Mail the coupon today and get this free catalog. Our money-back guarantee is your assurance that these tools will do everything we claim.

The Cornwell Quality Tools Co.,
Dept. "K", Cuyahoga Falls, Ohio.
Send me illustrated catalog with prices on full line of CORNWELL Hand-made Tools.



..... Where Employed
Name.....
Address.....
City..... State.....

SIMONDS

CIRCULAR SAW SPECIALISTS

A NEAR-CENTURY'S experience in making cutting edges of tempered steel has contributed greatly to Simonds' reputation as "Circular Saw Specialists". From the New Planer Saw that replaces the novelty type, to the sturdy inserted tooth metal saws, used widely for steel rails and other heavy work, all Simonds Circular Saws are alike in so far as they provide long-wearing cutting edges that boost production and cut costs.

SIMONDS SAW AND STEEL COMPANY
 "The Saw Makers" Fitchburg, Mass. Established 1832
 Branches and Service Stations in Principal Cities

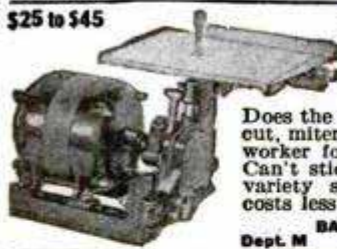


CALCULATIONS

In Office, School, Store and Shop can be instantly made with the Midget Slide Rule. It gives the answer to any problem involving fractions, mixed numbers, decimals, whole numbers, roots, powers, Logs, and Trig. Functions. Thousands of these rules are used by Accountants, Engineers, Clerks, Students, etc. It is the most versatile calculator ever invented. If you have any figuring to do, order a Midget Slide Rule on trial. Made of aluminum with figures on white celluloid. Size 4". Price with Instruction Book, \$1.50. Leather Case, 50c extra. Catalogue Free. Sent C. O. D. if desired. Your money back if you are not satisfied.

GILSON SLIDE RULE CO., Stuart, Florida.

\$25 to \$45



GET THE NEW IDEA BATES MOTOR SAW — 6 SAWS IN 1 —

Does the work of band-saw, rip-saw, cross-cut, miter, bevel and scroll-saw. A wonder worker for the home shop. Direct drive! Can't stick! Cuts 2" wood. Most amazing variety saw ever invented. Does more, costs less! Not a toy. Write for circular.

BATES MOTORCRAFT COMPANY
 Dept. M 28 N. Clinton CHICAGO, ILL.

BURN YOUR NAME ON TOOLS

WITH THE ARKOGRAF

PROTECT YOUR TOOLS FROM THEFT
 Write with electricity any name or design on the hardest and finest tools and instruments, or any metal, like writing on paper with pen or pencil. Complete Outfit \$3.50—Prepaid Anywhere. Interesting illustrated circular free. Write today. Agents wanted. ARKOGRAF PEN CO., 1171 E. Stark St., Portland, Oregon



The CRESCENT

20" band saw, 4' and 6' bench jointers, No. 12 saw table are adapted for use wherever there is wood work to be done. These machines are small but are substantially built. Ask for circulars.

In the larger sizes we can supply band saws, saw tables, jointers, shapers, variety wood worker, planers, planers and matchers, disk grinders, cut off table, swing saws, borers, hollow chisel mortisers, tenoners, self feed rip saw, universal wood workers,

THE CRESCENT MACHINE CO.
 93 Columbia Street, Leetonia, Ohio, U. S. A.

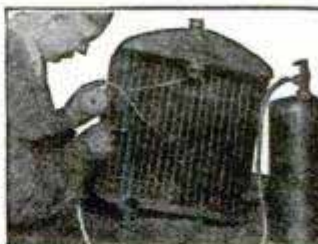


Catalog FREE!

GERSTNER High Grade TOOL CASES for Tool-makers and Machinists. Quality Goods at Lowest Prices.

Gerstner Sons

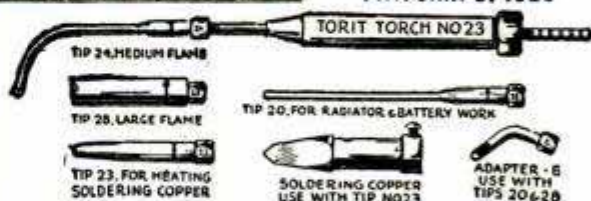
441 Columbia St., Dayton, Ohio



The Handy Tool
for the Handy Man

TORIT No. 23 Acetylene Torch

PAT. JAN. 5, 1926



Uses Acetylene Only. No oxygen or air pressure required. Tips suck in air. Simply connect to Presto auto tank, light gas, and the outfit is put to work. Gives Heat Instantly! Beats anything you ever tried for soldering, radiator repairing, melting, lead burning, tempering, heating, light brazing, etc. Consists of torch, 4 tips for different kinds of work, soldering copper, 5 feet rubber tubing, tank connection, and full instructions. All ready to use. Quickly \$7.50 pays for itself. PRICE, complete, without tank,

ST. PAUL WELDING & MFG. CO.

177 West Third Street

Saint Paul, Minnesota



R-4223
CARPENTER'S
KNIFE.

Large, heavy spear blade. Sheepfoot blade for scribing and coping. Pen blade. Stag handle. Nickel Silver bolsters and shield. Brass lining. Length, closed, 3 1/4 inches.

KNIVES FOR PARTICULAR PURPOSES FOR PARTICULAR PERSONS

NO ONE appreciates a fine knife more than a carpenter, whose success depends upon good tools. That is why Remingtons are so popular among carpenters. Remington's Carpenter's Knife was carefully designed for the carpenter's exacting needs. It has a large, heavy spear blade, a sheep-foot blade for scribing and coping, and a pen blade for lighter general use.

Carpenters recognize and appreciate the fine quality of material and workmanship in Remington knives. For more than a century Remington has been developing scientific, thorough and exact heat treatments for steel. Remington's methods of forging, hardening and tempering insure blades with the remarkably keen, durable and uniform cutting edges which are a distinguishing feature of all Remington pocket cutlery.

There is a Remington knife built especially for nearly every purpose for which a knife is used. If your dealer doesn't carry in stock the particular design you wish he will gladly order it for you. Send us his name and we shall mail you a circular describing our carpenter's and mechanic's knives.



R-6353

MECHANIC'S KNIFE. Equipped with large, strong, sabre blade. Small clip blade. Punch or reamer blade. Stag handle. Nickel Silver bolsters and shield. Brass lining. Length, closed, 3 1/2 inches.

REMINGTON ARMS COMPANY, INC.
25 Broadway Established 1816 New York City

Remington

© 1927—R. A. Co.

Rifles Ammunition Shotguns Game Loads Cutlery Cash Registers

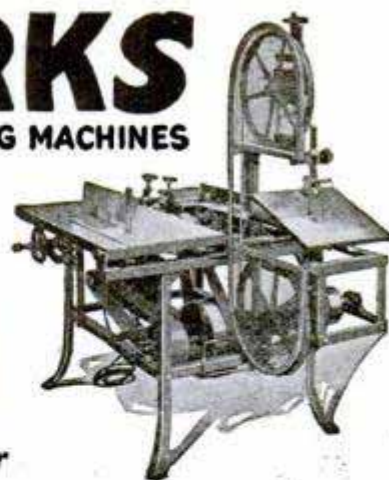
PARKS

WOODWORKING MACHINES

Cabinet
Shop
Special

\$290

with Motor



You ought to have this handy Parks in your shop. It is a compact, complete machine designed just like a big production outfit at one-fifth the cost. Includes 8-inch circular rip and cross cut saw with polished cast-steel saw table, 16-inch band saw with tilting table for bevel-sawing, 6-inch jointer, and motor operating from any light socket. Just plug in and go to work! Fits in a corner of your basement. Does any kind of cabinet and joinery work. Add lathe, shaper and other attachments any time at small cost. For the man who does "odd jobs" in his off time this Parks is a big money maker. Turn out as much as a four-man shop working by yourself.

Write for circular and Parks complete catalog of handy woodworking machinery.

The Parks Ball Bearing Machine Co.

1500-1540 Knowlton St.

Cincinnati, Ohio

Canadian Factory: 208 Notre Dame East, Montreal, Can.

LE PAGE'S GLUE

Handiest tool in your workshop.

In bottles, tubes and cans.



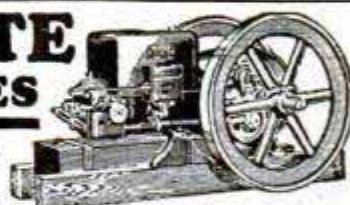
\$10⁰⁰

DOWN
Brings
this Lathe
to You

SYEPHER MANUFACTURING COMPANY
Dept. D Toledo, Ohio

WITTE ENGINES

200,000 in daily
world-wide use.



DIRECT From Factory—Wholesale Prices—Easy Terms—No Interest. 57 years proves WITTE most durable, economical—burns almost any kind of fuel—Semi-Steel Construction—Valve-in-Head Motor—WICO Magneto—THROTTLING GOVERNOR—LIFETIME GUARANTEE.

FREE CATALOG Describes New Improvements, New Low Prices and Long Terms. Also Log Saws and Pumps.

WITTE ENGINE WORKS

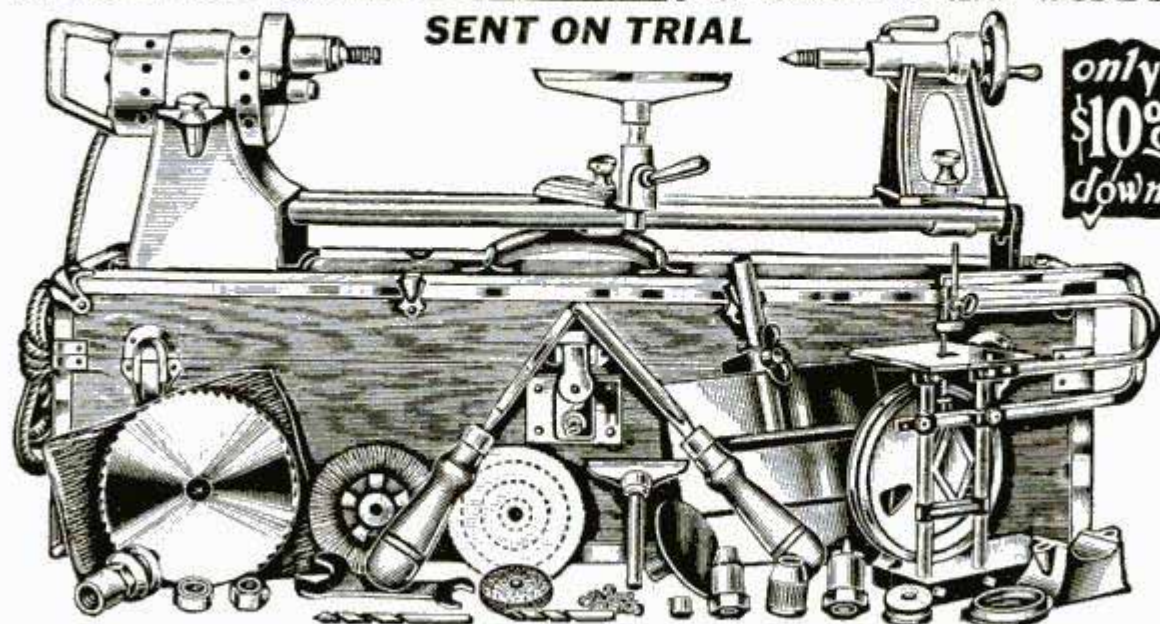
1741 Witte Building, KANSAS CITY, MO.

1741 Empire Building, PITTSBURGH, PA.

1741 Witte Building, SAN FRANCISCO, CAL.

NOW! MAKE THINGS AT HOME WITH THE NEW **RED JACKET** HOME WORK SHOP

SENT ON TRIAL



only
\$10.00
down



THE HOME CRAFTSMAN'S LATHE Will Make You a Craftsman

A COMPLETE SET OF PRECISION TOOLS electrically driven that will make you an accomplished workman. It is a chest full of tools that has been designed by a master for the private use of tool lovers and men who want to build, construct, invent and create at home. You will be able to make everything — attractive odd furniture, toys, home and garden improvements, all-around manufacturing, repairing.

free
CRAFTS
COURSE

free
BLUE
PRINTS

The complete equipment consists of the powerful Red Jacket Motor, with direct drive to an accurate wood turning lathe (capacity 9 in. x 34 in.); a bench saw, that has depth and side gauges; scroll and jig saw; and all accessories for both portable and stationary power drilling, buffing, grinding and cleaning. Attaches to any light socket and converts your work bench into a complete private tool and machine shop.

THE WACO GUARANTEE
IF IT IS NOT WHAT YOU WANT
When You Get It—SEND IT BACK

A SPECIAL CRAFTS COURSE

And blueprint service is free to Red Jacket Shop owners—all that there is to know about handicraft methods, raw materials, woods, carving, sawing, turning, designing, carpentering, decorating, is taught by special correspondence.

BUY ON YOUR OWN TERMS

Only \$10.00 down. Liberal discounts for cash. Easy monthly payment plans. It is no hardship to own a Red Jacket.

INTERESTING LITERATURE FREE

Just send the coupon. You will be surprised with all it contains. Beautiful, instructive, fascinating, interesting.

Everything Explained in Our Literature

WACO TOOL WORKS, 2915 So. Wabash Ave.
Chicago, Illinois

Manager, Dept. 105. Please send me particulars about 10-day free trial, free blue-prints and \$10 down payment.

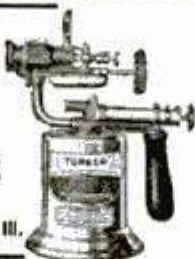
Name.....
Address.....

When You Want a **BLOTORCH**

That gives 400° more heat—
That's 100% sa'e—send for

TURNER MASTER No. 45
Only \$7.75, postpaid

TURNER BRASS WORKS, Industry Ave., Sycamore, Ill.



RAISE BELGIAN HARES

NEW ZEALAND REDS—Chinchillas—Flemish Giants
MAKE BIG MONEY—We supply stock and pay you following prices for all you raise: Belgian Hares \$2 each—New Zealand \$3 each—Chinchillas \$4 each—Flemish Giants \$5 each. 32-page illustrated book, catalog and contract, also copy of Fur Farming magazine, tells how to raise skunk, mink, fox, etc., for big profits, all for 10c. Address

OUTDOOR ENTERPRISE CO., Box 25, Holmes Park, Mo.

Makes Old Ford a Tractor

Now you can convert that old Ford car into a useful farm tractor without altering any Ford parts. We furnish the traction wheels, drive gears and auxiliary axle and mountings, ready to clamp on to the Ford frame. Pulls 16' plow.

Write for Free Particulars.
SHAW MFG. CO., Dept. S, Galesburg, Kan.



FREE TO BOYS

"THE SHOOTER'S ART"

Tells how to hold, aim and handle rifles; helps you guide others in correct knowledge of guns. Gives facts that make crack shots. Contains safety and common sense instruction every parent and boy should have. Helps to make boys leaders. Your copy Free. Write at once.

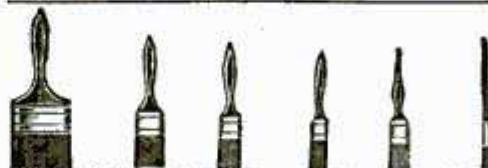
Send Now!

The NEW BENJAMIN Air Rifle

America's Original Air Rifle
Outshoots All Others

\$5 at your dealer's
or sent postpaid. Write!
BENJAMIN Air Rifle & Mfg. Co., 645 N. Broadway, St. Louis, Mo.

The
Shooter's
Art



All for
\$1.98
Plus
Postage

4" Wall 2" Varnish 1 1/2" Enamel 1" Lacquer 1 1/2" Auto Sash Marker
\$1.50 55c 35c 25c Lacquer 75c Tool 15c 10c
SAVE 40% Send for Price List of Paint Brushes of every type. **BILLIAM BRUSHES** will not shed. All pure bristles, set in rubber, vulcanized to a fine enamel handle, secured by nickel ferrule. Fully guaranteed. Money refunded if not satisfied after examination. Send no money. Order today.
Billiam Brush Co., 87 Nassau St., N. Y. City. (Ag'ts Wanted)
Send above combination C. O. D. to
Name.....Street.....
Town.....State.....



A Music Professor and the Harmonica

"Inspiring people to play a musical instrument means laying the foundation for much happiness and contentment" says Peter W. Dykema, Professor of Music Education at Columbia University. "No instrument is better adapted to universal use than the Harmonica. May the time soon come when everyone will feel it is an important part of his equipment."

This learned professor, who has taught thousands of students the way to happiness through music, knows that the Harmonica is one instrument which anyone may easily learn to play. And millions of people the world over know that to play the Hohner Harmonica is a source of happiness and satisfaction.

Get a Hohner Harmonica today and ask for the Free Instruction Book. If your dealer is out of copies write: M. Hohner, Inc., Dept. 181, 114 East 16th Street, New York City.



Enjoy a Big Powerful Radio: **30 Days FREE!**



27 in. long
MIRACO RADIO GETS 'EM COAST & COAST

Send for Proof

Users everywhere report it gets Coast to Coast, Canada Mexico, loud and clear on speaker; outperforms \$100 to \$200 sets. Some bear Europe. Marvelous bargain! Don't they unless 30 Days Trial proves it Most Selective, Clearest and Most Powerful Distance-Getter among big, fine 5-tube radios. Retail LIST price, now \$49.75. **Factory Prices—SAVE UP TO 1/2** Every set completely assembled, rigidly tested, fully guaranteed. Single Dial Sets, Speakers, batteries, tubes, etc., at big savings. **Free** literature, users' testimony and BIG SPECIAL OFFER. **USER-AGENTS WANTED** Write for discounts. **MIDWEST RADIO CORPORATION** Pioneer Builders of Sets 407-C Miraco Bldg., Cincinnati, O.

RADIO AT HALF USUAL COST

Now—we give 30 Days' Free Trial on newest 5-tube—ONE DIAL—Coast to Coast Radio. Buy direct from factory—save half and get 2 year guarantee. Full line table type, consoles or complete outfits at prices that will surprise you. Over 15,000 satisfied owners. Don't buy any Radio until you write us for FREE Catalog, low prices and 30 Day Trial offer.

Westingale Electric Co., 1755 Belmont Ave. CHICAGO

'B' BATTERY ELIMINATOR

Only **\$4.75**

MONEY-BACK GUARANTEE
No more worry with "B" Batteries! Hook up a Perfect "B" Battery Eliminator and forget battery troubles forever. This wonderful new invention means better reception, sharper tuning. Gives you more real pleasure from your set.

Completely Equipped—No "Extras" to Buy
Operates perfectly on direct or alternating current, giving up to 90 volts current, and using the full wave of the power supply. Simple directions enclosed—anyone can plug it in to any kind of set up to six tubes. Constant voltage gives set more power. Costs no more than set of good "B" Batteries. Solidly built in beautifully finished metal case, with genuine Bakelite top.

SEND YOUR ORDER NOW
Don't blame your set because run down "B" Batteries won't let it work right. Order your Eliminator NOW. Write name and address on a piece of paper, pin a dollar bill to it, and mail it TODAY. Pay postman balance (\$3.75 plus a few cents postage) when he delivers your Eliminator. Use it ten days. If not more than satisfied, return it and get your money back.

PERFECT ELIMINATOR CO.
V-2 National Theatre Bldg., Cincinnati, Ohio



THIS 100 PAGE
RADIO CATALOG
FREE

Contains "Hook Ups"
5 Radio
500 Illustrations
Over 1,000 Articles

"Build your own with 'Rasco' Parts"
RADIO SPECIALTY CO., 98 E Park Place, New York, N. Y.

American RADIO Now—
50% DISCOUNT ON RADIO!
BIG NEW 1927 CATALOG—FREE

Dealers, Agents, Set Builders—get our big 1927 Catalog—225 nationally advertised lines. Lowest prices in America! Largest, most complete stock. Radio's latest developments. It's FREE—send for your copy now. **American Auto & Radio Mfg. Co., Inc. 1525 McGee St., Kansas City, Mo.**

EVEREADY RADIO BATTERIES
are manufactured and guaranteed by
NATIONAL CARBON CO., INC.
New York Atlanta Chicago San Francisco Kansas City

FREE RADIO MAP

Size 28 x 33 inches with rule for measuring distances. List of radio stations, with call letters, and wave length, FREE if you send us names and addresses of five friends who have radios and what kind.
A. A. VIKING, 124 W. Austin Ave., Chicago

Neutral STARTING Position-

Fast and Slow Speeds

Forward & Reverse

You can start your Caille motor at the dock, and let it warm up. Then you can glide off—fast or slow, forward or back, by merely raising or lowering your steering handle. \$32.00 puts this wonderful outboard motor on your boat—the rest in easy payments. Get full facts—write today.

CAILLE MOTOR COMPANY
6218 Second Blvd., Dept. D, Detroit, Mich.

**4 1/2 Brake
H.P.**

SPEED

over 20 miles per hour

MASTER

CAILLE

**5 SPEED
TWIN**



*Miles from the cares of
the crowded road*

Why be a slave to gas and oil? Why bother with tire and engine troubles? Plan to leave cares behind this summer. Get a sturdy "Old Town Canoe" and set forth on the water trail.

That little lake near your home for instance—or that river that flows through your town; in fact, with an "Old Town" you can find thrilling joy on most any waterway.

For "Old Towns" are light and remarkably easy to handle. They respond to the slightest dip of the blade. They are perfectly balanced and steady too. Priced \$58 up. From dealer or factory.

Free illustrated catalog gives prices and complete information about sailing canoes, square stern canoes for outboard motors, dinghies, etc. Write today. **OLD TOWN CANOE Co.**, 1765 Middle St., Old Town, Maine.

"Old Town Canoes"

Like Finding Money!



—This Fast Way of
Selling Bottled Drinks

**Increases
Sales 100%
to 400%**

**Earns up
to \$675
a Month**

**Cuts Ice
Bill 33 1/3%
to 66 2/3%**

**Saves up
to 80%
Clerk Hire**

**Push a Warm Bottle IN
And a Cold One Comes OUT**

\$10 to \$30 a Day with

"LIQUID" BOTTLE COOLER

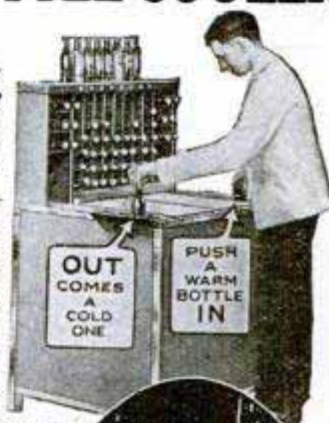
**Each Flavor has
Separate Cooling Tube—
Kept Filled Automatically**

No more leaky ice chests. No more tubs of ice water. No muss or disorder. Four times the trade and only half as much ice.

Look—144 bottles sorted by flavors in "Liquid" Bottle Cooler—a separate cooling tube for each—8 tubes in all—each one filled with cold bottles in ice water bath—quickest cooling method known. To serve any flavor, take warm bottle from reserve rack above, push it in proper tube, and out comes a cold bottle of same flavor on the other side. You can't get a cold bottle out until you push a warm one in, and a glance at reserve rack tells when stocks are getting low and when to reorder—you can't run short.

"Liquid Profits" Book Free

The "Liquid" Bottle Cooler looks like \$200 to \$500 yet costs only \$100 on easy terms. Stanley Edzey, Chicago, paid entire purchase price out of 5 weeks' profits. One man did it in 5 days. "Sales jumped from 4 cases a week to 16 or 20 a week—500% gain!" says Hardacre, Kansas City. "Saved \$1.00 a day on ice and paid for Cooler," says Murphy, Philadelphia. Martin, Minneapolis, writes, "Now save \$15 a week on clerk hire." Kruger, Chicago, says, "Sold 1200 bottles one day." Similar amazing reports flooding in from 25,000 merchants who now own "Liquid" Bottle Coolers. Get all the facts in Free Book "Liquid Profits"—full of photographs of installations, signed reports of profits, etc. Saturday Evening Post color pages tell millions why bottled drinks served from "Liquid" Bottle Cooler are better, cleaner, colder. Cash in on big demand created. Write today for "Liquid Profits"—sent free if you give name of local bottler. Mail coupon now.



Draws Crowds of
Good Spenders

Free Book

**"Liquid
Profits"**



**MAIL
THIS**

The Liquid Carbonic Corp.
Dept. PS, 3100 S. Kedzie Ave.
Chicago, Ill.

Send Free Book "Liquid Profits" and
Easy Terms on the Liquid Bottle Cooler.

Name _____

Street _____

City _____

State _____

My Business _____

Local Bottler _____

Suppose You Were Offered Diamonds at 60% of Market Price



Why Pay Full Prices

When Much Less Buys the Same
See this 3/4 less 1/16 ct., snappy solitaire for \$69.50. Try to match at \$115.00. Examine free any bargain at our risk. Startling, legitimate offers here of diamonds at 60% of market price. Send now for full details. Diamonds of unusual qualities (also watches) from unpaid loans, offered at radically low prices based on mere loan values. Then, too, we have hundreds of diamonds from big, cash, European deals with diamond cutters, who sacrificed these gems away under the market. Send now for our latest offers of this internationally known cash headquarters.



Unpaid Loan Listings Ready

As low as \$60 a Carat

Radically different from a catalog. List accurately describes every diamond in full detail with guaranteed exact weight, color, quality, etc. Explains **Guaranteed Cash—like Insurance Policy Loan guarantee.** Also **Unlimited Exchange** privilege at price paid us. Gives full details of free examination offers. Don't wait, the very diamond you want may be in this very list at a price that will amaze you. Costs nothing to see. Write today. A postal will do, or—

Mail Coupon NOW!



**Command Recognition
a DIAMOND Does It**

Name _____

Address _____

City _____

State _____

References by Permission:—Bank of Pittsburgh, N. A.; Marine National Bank; Union Trust Co., Pittsburgh, Pa. Your bank can look us up in the mercantile agencies.

JOS. DE ROY & SONS

Only Opposite Postoffice

1956 De Roy Bldg., Pittsburgh, Pa.

Without obligation to buy, send me free, in plain envelope, your Latest Bargain List of Diamonds, Watches, and other Jewels.

DOUBLE YOUR INCOME

SELL PIONEER \$23.50 All Wool Tailoring

FULL OR PART TIME

MAKE \$12.00 A DAY FROM START

Parttimemen \$5 an hour selling

famous Pioneer tailored-

to-measure all-wool suits at

\$23.50. Commissions Paid

in advance. Striking

leather brief case con-

taining 100 large watch

samples furnished—other equally

remarkable values at \$29.50 and

\$34.50. We train the inexperienced.

Men with determination and willing-

ness to work for success write for this

big money making opportunity, today.

Pioneer Tailoring Co., 159 W. Harrison St., Dept. E 1116, Chicago



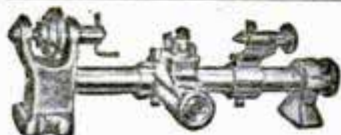
YOU NEED SARGENT PLANES

See them at your hardware dealer's. For booklet write

Sargent & Company, Manufacturers

49 Water Street

New Haven, Conn.



WADE AMATEUR MECHANICS, REPAIR SHOPS, INVENTORS, STUDENTS

BENCH LATHE
A real machine tool for the home work bench—capacity 4" dia. x 12" length. For Metal—Wood—Compo-
sition Materials. Turning—Facing—Boring—Drilling—Winding—Thread Cutting. Accurate—Strong—Quiet
—Compact. Slide-rest has travel entire length of bed. Leadscrew inside bed. No. 1 Lathe, plain head-
stock, \$28.00. No. 2 Lathe, back-gear headstock, \$58.00. Extra for lathes with 18 inches be-
tween centers, \$7.00. Complete line of accessories at equally low prices. Write for free catalog.

THE GEROLD CO.,

Dept. P-34,

120 Liberty St.,

New York

I Earned \$2200 IN FOUR MONTHS

THIS is Richard A. Oldham. He earned \$2200.00 in four months with a Haywood Tire Repairing outfit. For 20 years he was telegraph operator on the Illinois Central Railway. He is now 58 years old. He answered my advertisement—quit his job—bought a plant and opened a business. He just wrote me: "I have made more in eight months than 2 1/2 years as operator." There are now 500 stations where tire repairing is neglected.

I Must Have 500 Men To Fill These Positions

I have a Big interesting Book to send you. It tells all about tires—gives inside figures and profit. Send for it! What Oldham and others are doing. You can do. \$4500 to \$7500 per year is conservative. Open a shop. You can get business all around you. Put out a Haywood Sign and business will come to you. Now get started. Send for the Big Book and start making money.

V. A. FANTUS, Pres.
HAYWOOD TIRE EQUIPMENT CO.
1844 South Oakley Ave., Chicago, Ill., U.S.A.
Cable Address Fanbro

Now, Only \$39

Let Me Send You the Greatest LOG SAW Offer

—I ever made. One man saws 15 cords a day—easy. Falls trees, saws limbs. Make big money. Use 4 H.P. Engine for other work. Saws faster than 10 men. Shipped from Factory or nearest of 10 Branch Houses. Cash—Easy Terms. Write for 30-Day Trial Offer and big FREE book.

OTTAWA MANUFACTURING COMPANY
1741-W Wood Street, Ottawa, Kan.
Room 1741-W Magee Bldg., Pittsburgh, Pa.

Factory to Rider

Saves \$10 to \$25 on the Mead Bicycle you select. You can have your choice of 44 Styles, colors and sizes. Delivered free on approval. \$21.50 up.

30 Days' Free Trial

on the bicycle you select from the big free catalog. Ride it a month to be sure you like it. Return it if not satisfied.

Tires—best quality, factory prices. Save big money on lamps, wheels and equipment, low prices. Send No Money, do business direct with makers.

MEAD CYCLE COMPANY
DEPT. C-110 CHICAGO

Write today for free Catalog, factory prices and marvelous new offer.

AGENTS AND SIGN MEN

Now Making \$50.00 to \$100.00 and Up Per Week Selling Our **GOLD LEAF SIGN LETTERS**

R

For store and office windows, board signs, trucks and glass signs. We also make to order script signs and business emblems singly or by the thousands. A permanent business. No capital or experience required. Big demand in every city. Samples and Literature Free.

CONSOLIDATED SIGN LETTER CO. 69X W. Van Buren CHICAGO, ILL.



TELLS ALL ABOUT THE
15 New Features

as well as the many other features of the wonderful Motor that thrilled the world in 1926 by its remarkable speed and power. You will want to know especially about "The Pilot"—a NEW device that steers your boat in any course you choose—straight or curved, without attention from anyone. Leaves you free to cast, or troll or rest. The New—

LOCKWOOD FORMERLY BOAT MOTOR

also offers you many other advantages—improvements in Power, in Speed, in Ease of Starting, in Stopping, in Convenience and Durability. Find out all about them before you choose any Motor. Get the facts now.

WRITE FOR FREE FOLDER

Just out—See how Lockwood is blazing the way by advanced engineering methods backed by 23 years of marine engine building experience. (24)

LOCKWOOD
MOTOR COMPANY
716 Jackson St. Jackson, Mich.

MAKE YOUR FORD Into The "LARK"

\$5.00 Red-I-Kut life size patterns Class—Snap



38-inch Easy Riding Seat

Famous sure-fit RED-I-KUT life-size patterns and picture instructions show how you can easily convert your Ford into this Fast, Saucy, Sport Car as thousands have done, with easily obtained materials. No need to lay up the car. Rear seat folds, making 4-passenger car. Send 10c coin for actual body, photo "Swing-Lo" fenders, Tops and Windshields. ORDER RIGHT NOW.

KUEMPEL COMPANY, 84 Kuempel Bldg., GUTTENBERG, IOWA

Don't go
into the
woods
without the CEEBYNITE
a Taylor Compass



If your Dealer cannot supply You, write

Taylor Instrument Companies

ROCHESTER N.Y.

Canadian Plant, Tycoo Bldg. Toronto

There's a Taylor or Taylor Thermometer for Every Purpose

Pathex

**AUTOMATIC
MOTION PICTURE
CAMERA AND PROJECTOR**



A complete
Motion Picture Outfit
at a lower cost!

THE Pathex outfit provides all you need for perfect modern motion picture photography and projection at least expense and with absolute safety—for all Pathex film is non-inflammable!



The CAMERA

is simple and automatic—just a few seconds to load, then aim and press the button—that's all! All Pathex films are developed free at Pathe Laboratories.



The PROJECTOR

motor-driven, enables you to show your own and Pathex Library films just as easily and conveniently as they are taken. Operates from ordinary lighting current.

The LIBRARY

of Pathex films puts at your disposal a vast range of motion picture subjects for use with your own films for ever-ready, up-to-date entertainment of young and old.

PATHEX, Inc.

35 West 45th Street New York, N. Y.

Demonstration at your
dealer's or write direct to
us for illustrated booklet.



All day long—hair smoothly in place!

Ask any 10 College Men

how they keep their hair in place...

If you want the straight dope on how to make unruly hair lie down—ask a college man.

Or ask 10 college men.

We ourselves actually talked to 958 college students—went all over the country to see them. And we found?—

The hair dressing college men prefer above all others is—*Stacomb!*

And why? Because, they told us, Stacomb really does keep your hair in place—smooth, right—all day long.

And more!—Stacomb never makes your hair look sticky. Nor dried out, as when you wet it with water. Stacomb is actually beneficial—it helps to prevent dandruff.

Stacomb comes as a combing cream—in jars and tubes—and now in the popular new liquid form as well. All drug and department stores.

**FREE
OFFER**

Stacomb

Standard Laboratories, Inc.,
Dept. BB-7, 113 W. 18th Street, New York

Send me free sample of Stacomb as checked:

Original, cream form ☐

New liquid form ☐

Name.....

Address.....

Catch Fish!

Eels, Mink, Muskrats with our new folding galvanized

STEEL WIRE TRAP. Write for our **FREE TRAP OFFER** and Bargain Catalog. \$1 Box of our famous Fish Bait FREE to introduce our traps.

WALTON SUPPLY CO., 3500 JUNIATA AVE., ST. LOUIS, MO.



This  Reg. Trade Mark
Guarantees you genuine diamonds.

SEND NO MONEY

Terms (6 Months to Pay)

No. 6132. Solid Gold Men's Initial or Emblem Ring. 2 Genuine Diamonds 4-100 ea. 14-Kt. White Gold Top. Emblem (any lodge) or any initial (Old English) Yellow or White Gold inlaid in Genuine **Hope Ruby or Black Onyx.**

Genuine Full Cut Diamonds, No Chips

No. 6598 Any initial (raised gold) or Eastern Star, Rebecca, Mason, Shrine, K. of C. emblem if desired.

Send number of ring, size of finger, initial or emblem desired, and ring will be sent for inspection.

Ask for Free Jewelry Catalog

\$25 Buffalo Jewelry Mfg. Co., "The Mail Order House"

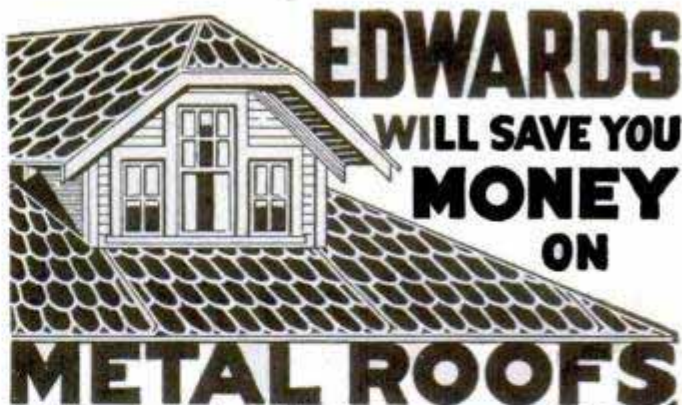
Dept. P (or at your Jeweler's)

501 Washington Street,

Buffalo, N. Y.



Ladies' Ring
Genuine **\$15**
Black Onyx
Cut Diamond. 14-Kt.
White Gold.



EDWARDS
WILL SAVE YOU
MONEY
ON

METAL ROOFS

We own our own steel mills, roll our own sheets, make them into high-grade REO METAL SHINGLES, Sidings, Ceilings and Roofings of every type and style for every kind of building. We control every operation from the raw material to the finished roof and we sell direct from our factories to the user. Not a dollar to divide with anybody but the customer! You get better value for less money.

OUTLAST THREE ORDINARY ROOFS

EDWARDS METAL ROOFS are weather-proof, lightning-proof, fire-proof! The galvanizing bends with the metal. No tools required.



LOW-COST ALL-METAL GARAGES

Any size. Any style. Portable. Ready to erect. Complete with frames, doors, sash and hardware. Ornamental,

durable, economical. Blue-prints and complete instructions FREE. Write today. Get our low prices and Free Samples. Ask for Roofing Book No. 150 or for Garage Book No. 150

THE EDWARDS MFG. CO.
500-550 Butler St. Cincinnati, O.



DENINGER WILL TRUST YOU

SEND 20c INSTAMPS FOR CATALOGUES
BIG MONEY SAVING FOR YOU

Used and rebuilt motorcycles \$25 to \$100.
used bicycles \$9.50, tandem \$20.
All machines fully guaranteed.
New bicycles and motorcycles
at factory prices, save dealers'
profits. Motorcycle and auto-
mobile tires \$3. Complete line
frames, engines, supplies.

DENINGER PRICE CUTTER, ROCHESTER, N. Y.
PAY AS YOU RIDE

SHAW MOTOR ATTACHMENT MAKES YOUR BIKE A MOTORCYCLE!

A high grade 2 1/2 H. P. motor attachment quickly clamped on any bike frame. Speed 4 to 40 miles an hour. 90 to 125 miles per gallon of gas. **Special Low Price Now!** Write today for Complete Description and Special Low Prices on SHAW Motor Attachments and the SHAW Complete Motorbicycle.

SHAW MANUFACTURING COMPANY
Dept. 37

Galesburg, Kansas



FOY'S BIG BOOK, in Colors

A complete guide to successful Poultry and Squab Raising. Low prices on CHICKS, Breeding Stock and PIGFONS. Write Today! FREE!

FRANK FOY, Box 18, Clinton, Iowa



"Speeditwin"

Pacific Coast Champion Evinrude
tremendously improved



SPEEDITWIN for 1927—Evinrude's greatest triumph. New! Different! Far advanced! Weighs only 75 lbs. Delivers full 8 H.P. Lighter, faster, sturdier than the famous Evinrude Big Twin that won the 1926 Pacific Coast Championship; crossed America in 1925.

Three other models—4 H.P. Fastwin 49 lbs.; 2 1/2 H.P. Sportwin 44 lbs.; and 2 H.P. Utility Single. Speeds up to 27 M. P. H. Exclusive, copyrighted "Boat-Speed Guide" tells at glance which motor will give you the results you want. Standardized down payment of only \$30 regardless of model. Standardized, low monthly terms—a long time to pay.

Free Trial Guarantee

—refunds money if not satisfied. That's the confidence we have in Evinrude superiority and in your liking this sport. Every outing is a real vacation. No traffic rules, no way to be reckless.

New Evinrude Year Book

Motors in actual color, 40 interesting pages showing beautiful waterways, speed records—complete facts! Send for free copy today.

EVINRUDE MOTOR COMPANY

2403 27th Street

Milwaukee, Wis.



MOTORCYCLES

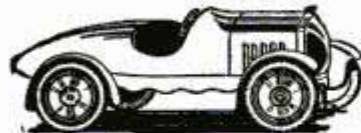
WE WILL TRUST YOU
Pay As Low As \$2.00 per Week
Hendersons, Harley-Davidsons, Indians

Slightly used and rebuilt. Hundreds to select from.

Send 10c for list today.

MYEROW BROS. CO., 15 Berkeley St., Boston, Mass., U. S. A.

Sport Bodies for Fords AT FACTORY PRICES!



This Model in Grey Prime **\$39.50**

Write for Booklet A-2 Showing Other Models.

SPORT FACTORIES, AURORA, ILL.

Thompson
BEATS
the World
on BOATS

BETTER BOATS at Lower Prices



The BEST that Skill and Experience can Produce
TWO BIG FACTORIES

Our complete line of 22 models offers you a variety to choose from. Prompt shipment from factory to you. **Catalog Free—Save Money—Order by Mail** Please state kind of boat in which you are interested.

THOMPSON BROS. BOAT MFG. CO. (20)
201 Ann St., PESHTIGO (Write to either place) WISCONSIN
101 Elm St., CORTLAND NEW YORK

WURLITZER

TRADE MARK THE WORLD'S LARGEST MUSIC HOUSE



200 Years Ago in the little Saxony town of Shoenek lived Hans Adam Wurlitzer, Master Violin Maker. His shop was a gathering place for musicians of the time, for he was a true craftsman.

When he died his shop passed into the hands of his eldest son, and for seven generations, down to the present day, the descendants of Hans Adam Wurlitzer have carried on his work.

Today in every Wurlitzer instrument you will find a quality, a character, that could not come from mere excellence of manufacture. It is the heritage of these seven generations of music craftsmanship.



Try any Wurlitzer Instrument in your Own Home

YOU may now have any Wurlitzer instrument for a generous free trial in your own home. Examine the instrument, show it to your friends, play it as much as you wish. No obligation to buy—no expense for the trial. We make this liberal offer because we want you to try for yourself these wonderful instruments, the result of 200 years' experience in musical instrument building.

Easy payments are arranged to suit your convenience. This is your opportunity to try a famous Wurlitzer instrument in your own home.

Send for

New Catalog

The greatest musical catalog ever published. Over 3,000 articles—every known instrument described and illustrated; many of them shown in full color. Gives you lowest prices and all details of Free Trial, Easy Payment plan. All sent **FREE**—no obligation.

Send this Coupon

THE RUDOLPH WURLITZER CO., Dept. 1775

120 W. 42nd St., New York

117 E. 4th St., Cincinnati

329 S. Wabash Ave., Chicago

134 Golden Gate Ave., San Francisco

Send me absolutely free, your new illustrated catalog, with prices and description of every known musical instrument. Also tell me how I may try any instrument in my own home and pay for it in small monthly sums. No obligation.

Name

Address

City State

Instrument

(State instrument in which you are interested)

Copyright, 1927, The Rudolph Wurlitzer Co.

Our 50th Birthday Sale

Celebrating our 50th Anniversary, we are offering these big specials at prices unheard of before. Convince yourself; examine the article of your choice without obligation. Simply send your name and address with the deposit mentioned, and your choice will come for approval and a 15 day trial. If you can duplicate your purchase for less money elsewhere, send it back and your deposit will be refunded. If satisfied, pay the balance in 10 equal monthly payments. Our Charge System is simple, easy, convenient. Prompt delivery, no difficulty, no interest charge, everything confidential.

A. Gent's 14-karat green gold Ring with white gold top; AA1 blue-white diamond. \$65. \$5 with order \$6 a month.

B. True Lovers Knot Engagement Ring, hand carved in 18-karat white gold; AA1 blue-white diamond. \$65. \$5 with order, \$6 a month.

C. Artistic design 18-karat white gold Ring; AA1 blue-white diamond. \$50. \$3 with order; \$4.70 a month.

D. 18-karat white gold carved Wedding Ring; five blue-white diamonds. \$29.50. \$2 with order; \$2.75 a month.

E. 14-karat white gold Gent's Initial Ring; Old English Initial on genuine Onyx. Mention Initial. \$22.50. \$1 with order; \$2.15 a month.

It's FREE! Send for our Golden Jubilee Booklet

LW-SWEET INC.

Dept. 67-K, 1660 BROADWAY, NEW YORK.

Over 3000 other Specials in Diamonds, Watches and Jewelry in this booklet.

G. Jolt-proof Gent's Strap Watch; 14-karat gold filled; 16 jewels. \$25. \$2 with order.

F. 17-jewel Illinois Watch; 14-karat green gold filled case, \$35. \$2 with order, \$3.30 a month.

H. 14k solid white gold, 4 diamonds; 4 blue sapphires; 16 jewels. \$42.50. \$3 with order \$3.95 a month.

BUY TODAY

The Modern Way

Terms as low as

\$1 Down

\$351⁰⁰ CLEARED IN ONE DAY

So writes W. H. Adams of Ohio in August 1925. V. A. Marini of California reports \$11275 sales in three months. Jacob Gordon of New Jersey \$4000 profits in two months." Alexander of Pennsylvania "3000 profits in four months." Ira Shook \$365 sales in one day. Bram bought one outfit April 5 and 7 more by August 28. Iwata, bought one outfit and 10 more within a year. Mrs. Lane of Pittsburgh says "sold 8000 packages in one day. J. R. Bert says "only thing I ever bought that equaled advertisement." John Culp says:

"Everything going lively. Crispette wrappers scattered all over town. It's good old world after all." Kellogg, \$700 ahead end of second week.



WE START YOU IN BUSINESS

Furnish secret formulas, raw material, and equipment. Little capital required; no experience needed.

Build a Business of Your Own

No limit to the sale of Crispettes. Everybody likes them. It's a delicious food confection. Write for facts about a business that will make you independent. Start now, in your own town.

Profits \$1000 a Month Easily Possible

Send postal for illustrated book of facts. It contains enthusiastic letters from others—shows their places of business, tells how and when to start, and all information needed. Free. Write now!

LONG-EAKINS COMPANY

528 High Street

Springfield, Ohio



"Independent" GOLD POINT
Lever, Self-Filler Stylopen
"Makes Writing a Pleasure"
Jumbo, \$3.50; Red, \$3.00; Black

\$2

J. C. ULLRICH & CO., 161 Washington St., N. Y. Est. 1884 Agents Wanted

Beautiful HOUSES \$900 and BUNGALOWS

CAN BE BUILT FOR AND UP

This and many others in my new book, Building Plans for Modern Homes, will save you hundreds of dollars. One of the most complete and comprehensive books of plans ever published by any architect. New edition just off the press. Nearly 600 floor plans and photographs of Colonial houses, bungalows, etc., costing from \$300 up; gives sizes and cost to build. Sent postpaid for \$3.00.



FREDERICK H. GOWING
ARCHITECT
101 Tremont St., BOSTON, MASS.

HOW A BOY BUILT UP A GREAT SQUAB FARM



Started small in backyard when at school with no money, now has \$30,000 plant, ships to New York 150 bbls. squabs yearly, receiving \$75 to \$100 a barrel. You can do the same. Send for this book. Price is fifty cents but we will mail it to you for the names and addresses of four of your friends and your own name and address. Write today to

Plymouth Rock Squab Co., 634 A St., Melrose High., Mass.



New Plan!
makes it easy

\$50⁰⁰ to \$100⁰⁰ Weekly

Selling Shirts Direct to Wearer.
No capital or experience needed.
Spare or full time. Established 1885.
Represent a real manufacturer.

WRITE FOR FREE SAMPLES
MADISON SHIRT MILLS, 562 BROADWAY, NEW YORK

Agents - Salesmen

New, patented Cigarette and Match Case. Holds a package of cigarettes and box of safety matches. Made of grain finish, black leatherette.

A whirlwind seller—write for particulars on liberal profit proposition.

**ALL-IN-ONE
SALES COMPANY**

Dept. A-5 2810 Portland Ave.
Minneapolis, Minnesota



SAMPLE
50c

\$542⁰⁰ Earned IN ONE MONTH

A BIG MONEY-MAKING BUSINESS

A BUSINESS TO ENTHUSE OVER—THE "IDEAL" LAWN MOWER SHARPENER

A wonderful invention that sharpens lawn mowers scientifically—quickly—perfectly; does the work as nothing else can.

W. T. Moore, Twin Falls, Idaho, writes: "The Ideal Grinder, as a side line, netted me a profit of \$1200.00 in 90 days."

W. F. Kendt, Buffalo, writes: "I sharpened 994 lawnmowers last season and the receipts were nearly \$2,100 which is not bad for a side line."

LAWN MOWERS SHARPENED TO RAZOR EDGE

People glad—owners delight in mowing lawn with mower sharpened on an "Ideal." Mower runs light—click-click-click and the grass is cut. Build permanent business for yourself. Start Now! No town too small.

Use Your Spare Time If you work at a trade, put an "Ideal" in your basement and earn \$4 to \$6 an hour evenings and Saturday afternoons.

WRITE TODAY for full information of this wonderful money-making machine. **FREE**

THE FATE-ROOT-HEATH MANUFACTURING COMPANY
Plymouth, Ohio

Zeno Brandon, Middletown, Ohio, writes: "I made \$820.70 in 55 days with my 'Ideal.' Have made as high as \$38.70 in one day."

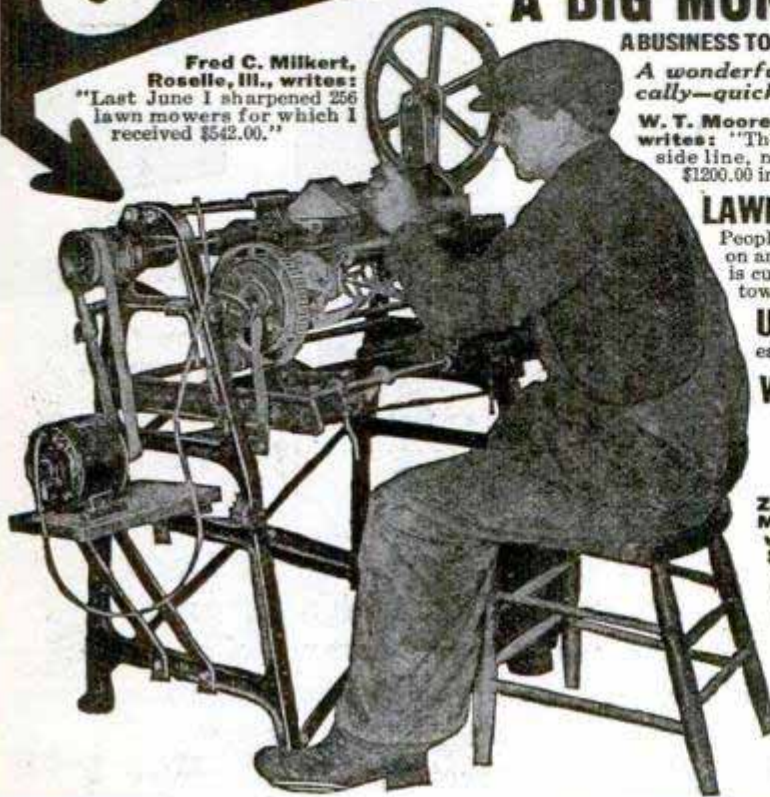
USE THIS — MAIL IT TODAY

The Fate-Root-Heath Company
818-844 Bell Street, Plymouth, Ohio

Please mail free Illustrated Catalog and booklet with scores of letters from "Ideal" owners and pictures of their shops.

Name _____

Address _____



Fred C. Milkert, Roselle, Ill., writes: "Last June I sharpened 256 lawn mowers for which I received \$542.00."



A Genuine \$2 Knife for \$1.18 Postpaid

Handy shaped Blade makes this knife best for mechanics, sportsmen and farmers; light but strong; re-sharpened easily. Stag handle. German silver finish; blades file tested, hand forged from razor steel and warranted.

Direct at Factory Prices

Sample \$1.18 3 for \$3.00 Postpaid

Hand Forged Razor Steel Blades

Send for our 100-page FREE List and "HOW TO USE A RAZOR."

Maher & Grosh Co.
106 A St., Toledo, Ohio

HUGHES 5 TUMBLER "NONPICKABLE" KEYHOLE LOCK

Send Only \$1

PROTECT YOUR HOME FROM BURGLARY—Only 5 tumbler non-pickable keyhole lock made. It locks the KEYHOLE, automatically. Brass. Fits standard keyholes. Lock and 2 keys.

Mfd. and Sold by M & H NOVELTY CO.
1466 W. 28th St., Los Angeles, Calif. (Bank Refs.)
Also makers of Hughes Gearshift Extensions—They fit all cars.

AGENTS 500% PROFIT GENUINE GOLD LEAF LETTERS

S guaranteed to never tarnish. Anyone can put them on stores and office windows. Enormous demand, large profits. Paul Clark says: Smallest day \$28.70. R. L. Reel made \$920 in two months. Write today for free sample and liberal offer to general agents.

METALLIC LETTER CO., 433-B N. Clark St., CHICAGO

100 SCALE PLANS



for building old and modern ship models. Send 6 cents for catalog of plans, books, prints, maps and other things that smack of the sea.

SEA ARTS GUILD, 405-A Eleventh Avenue, MILWAUKEE, WIS.

PLASTIC WOOD

As Useful to Yachtsmen as to Home Owners



On board boats as well as in industry and in countless homes PLASTIC WOOD is doing many woodworking jobs quickly—and permanently.

Taken soft from the can, PLASTIC WOOD will adhere to metal or wood. It hardens on exposure to air and may be worked with tools and painted, stained or varnished.

Use PLASTIC WOOD to make casters solid in furniture, in cabinet making, or in repairing indoor or outdoor woodwork. Boat owners use PLASTIC WOOD to set stuffing boxes and for countless construction and repair jobs.

Sold by Hardware and Paint Stores: ¼ lb., 35c; one pound, \$1.00. Send coupon if dealer cannot supply you.

ADDISON-LESLIE COMPANY
40 Bolivar Street, Canton, Mass.

Please send me ¼-pound can of PLASTIC WOOD for which I enclose 35c.

Name _____

Address _____

PATENT

Protect Your Ideas

Take the First Step Today

If you have a useful, practical, novel idea for any new article or for an improvement on an old one, you should communicate with a competent Registered Patent Attorney AT ONCE. Every year thousands of applications for patents are filed in the U. S. Patent Office. Frequently two or more applications are made for the same or substantially the same idea (even though the inventors may live in different sections of the country and be entirely unknown to one another). In such a case, the burden of proof rests upon the last application filed. Delays of even a few days in filing the application sometimes mean the loss of a patent. So lose no time. Get in touch with me at once by mailing the coupon on the opposite page.

Prompt, Careful, Efficient Service

This large, experienced organization devotes its entire time and attention to patent and trade mark cases. Our offices are directly across the street from the U. S. Patent Office. We understand the technicalities of patent law. We know the rules and requirements of the Patent Office. We can proceed in the quickest, safest and best ways in preparing an application for a patent covering your idea. Our success has been built on the strength of careful, efficient, satisfactory service to inventors and trademark owners located in every state in the Union.

NO CHARGE for Information On How to Proceed

The booklet shown here contains valuable information relating to patent procedure that every inventor should have. And with it I will also send you my "Record of Invention" form on which you can sketch your idea and establish its date before a witness. Such evidence may later prove valuable to you. Simply mail the coupon and I will send you the booklet, and the "Record of Invention" form, together with detailed information on how to proceed and the costs involved. Do this NOW. No need to lose a minute's time. The coupon will bring you complete information entirely without charge or obligation.

My Patent Law Offices
Just Across
Street From
U.S. Pat. Office



Above is a view of my drafting and specification offices where a large staff of experienced experts are in my constant employ. All drawings and specifications are prepared under my personal supervision.

NEWS

Inventors Write for these Free Books

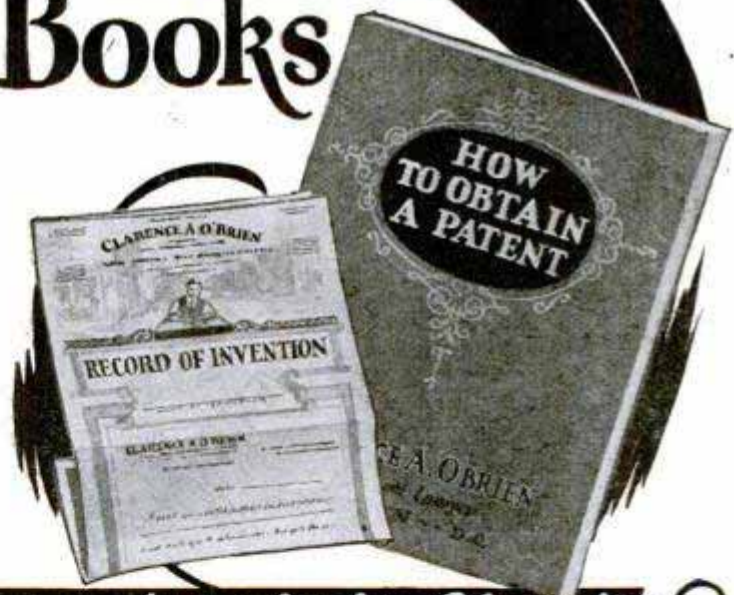
Strict Secrecy Preserved

All communications, sketches, drawings, etc., are held in strictest confidence in strong, steel, fireproof files, which are accessible only to authorized members of my staff. Feel free to write me fully and frankly. Your case will have my personal attention. It is probable that I can help you. Highest references. But **FIRST**—clip the coupon and get my free book. Do **THAT** right now.

Clarence A. O'Brien

Registered Patent Attorney

Member of Bar of: Supreme Court of the United States; Court of Appeals, District of Columbia; Supreme Court, District of Columbia; United States Court of Claims. Practice confined exclusively to Patents, Trade marks and Copyrights



Clip this Coupon and Mail it Now!

CLARENCE A. O'BRIEN, Registered Patent Attorney

70-X Security Savings and Commercial Bank Bldg., Washington, D. C.

Please send me your free book, "How to Obtain a Patent," and your "Record of Invention" form without any cost or obligation on my part.

Name.....
(Important: Write or Print name clearly.)

Address.....



Our New York Office
Suits 1007 Woolworth Bldg.



Our Philadelphia Office
Suits 714-15 Liberty Bldg.



Our Washington Office
Victor Building

PATENTS TRADE-MARKS AND COPYRIGHTS

Have You An Idea?

Our Offer: FOR THE PROTECTION OF YOUR INVENTION YOUR FIRST STEP

Before disclosing an invention the inventor should write for our blank form

"RECORD OF INVENTION"

This should be signed and witnessed and returned to us together with model or sketch and description of the invention for INSPECTION and INSTRUCTIONS

No Charge for the Above Information

Our Four Books Mailed Free to Inventors

Our Illustrated Guide BOOK

HowtoObtainPatent

Contains full instructions regarding U. S. Patents. Our Methods, Terms, and 100 Mechanical Movements illustrated and described.

Our Trade Mark Book

Shows value and necessity of Trade Mark Protection. Information regarding *Trade Marks and unfair competition in trade.*

Our Foreign Book

We have Direct Agencies in Foreign Countries, and secure Foreign Patents in shortest time and lowest cost.

Progress of Invention

Description of World's Most Pressing Problems by Leading Scientists and Inventors.

We Regard a Satisfied Client as our best advertisement, and furnish anyone, upon request, lists of clients in any state for whom we have secured patents.

*Highest References—Prompt Attention
—Reasonable Terms*

VICTOR J. EVANS & CO.

PATENT ATTORNEYS

Main Offices: 956 9th St., N. W., Washington, D. C.

Opposite U. S. Patent Office

PATENTS TRADE-MARKS AND COPYRIGHTS

IMPORTANT

TO HAVE YOUR CASE MADE SPECIAL AND AVOID DELAY YOU SHOULD HAVE YOUR CASE MADE SPECIAL IN OUR OFFICE to secure protection, save correspondence and secure early filing date in Patent Office. To secure special preparation of your case send \$25.00 on account with model or sketch and description of invention.



MAIN OFFICE, VICTOR J. EVANS & CO.—VICTOR BUILDING, WASHINGTON, D. C.

Our Lawyers Practice in all U. S. Courts and defend Clients in Suits involving Patents, Trademarks and Copyrights

All Communications and Data Strictly Confidential.
Interference and Infringement Suits Prosecuted

OUR ORGANIZATION OFFERS PERSONAL SERVICE
By Experienced Patent Lawyers, Solicitors and Draftsmen

**FREE
COUPON**

**VICTOR J. EVANS & CO.
PATENT ATTORNEYS**

NEW YORK OFFICES
1007 Woolworth Bldg.

CHICAGO OFFICES
1114 Tacoma Bldg.

PHILADELPHIA OFFICES
714-715 Liberty Bldg.

PITTSBURGH OFFICES
514 Empire Bldg.

SAN FRANCISCO OFFICES
Hobart Bldg.

MAIN OFFICES: 956 9th Street, N. W., WASHINGTON, D. C.

Gentlemen: Please send me *Free of Charge* your books as described on preceding page.

Name

Address



Our Chicago Office
Suite 1114 Tacoma Building



Our Pittsburgh Office
Suite 514 Empire Building



Our San Francisco Office
Suite 1010 Hobart Building

PATENTS

Just as it is important that you protect your idea with a patent, so it is imperative that your patent covers your invention completely. The one best way to assure this is to retain a reliable, experienced patent attorney

MUNN & CO. PATENT ATTORNEYS

Associated for 81 years with the Scientific American

1572 SCIENTIFIC AMERICAN BLDG.
24 West 40th Street, New York

523 SCIENTIFIC AMERICAN BLDG.
Washington, D. C.

1312 TOWER BUILDING
Chicago, Ill.

520 VAN NUYS BUILDING
Los Angeles, Cal.

655 HOBART BUILDING
San Francisco, Cal.

Ask for free copy of "Patents — A Book of Facts Every Inventor Should Know" and for "Inventor's Diary." Send for them NOW.

PATENTS

Booklet Free

Promptness Assured

Highest References

Best Results

Send drawing or model for preliminary examination of Patent Office records.

ALL BUSINESS GIVEN PROMPT AND PROPER ATTENTION

Listed Patent Lawyer in the latest editions of the Rand-McNally Directory of Bankers and Attorneys, of Chicago, Ill.; The Baggott & Ryall Directory of Attorneys, New York City; The Lawyers Guaranteed Directory, Detroit, Michigan; The Lawyers and Bankers Quarterly, published by the Legal Directory Publishing Company of St. Louis, Mo.; the American Lawyers Annual, Cleveland, Ohio.

WATSON E. COLEMAN,
REGISTERED PATENT LAWYER

Victor Building, 724 Ninth Street, N. W.
WASHINGTON, D. C.

1000 NEEDED INVENTIONS!

Here is the most remarkable book ever offered to inventors. One Thousand needed inventions listed and described. Arranged as follows: General Problems; Automotive; Mechanical; Electrical; Chemical; Radio; Marine. Separate chapter on the Ten Most Needed Inventions. This book may give you one idea that will win you a fortune! Nothing else like it has ever been published. Compiled at enormous expense. Edited by Raymond Francis Yates, formerly Managing Editor of a leading scientific magazine. Over 100 pages, durably bound. Send no money. Pay postman only \$1.00 plus postage on arrival. (Outside U. S. \$1.20, cash with order.) Money back after 10 days' examination if desired. Limited edition. Write NOW.

BUREAU OF INVENTIVE SCIENCE

DEPT. 35

ROCHESTER, NEW YORK



PATENTS

Send us sketch or model for advice and exact cost of patent. Our book "How to Obtain a Patent" sent free. It tells how to apply for Patents, Trade Marks, Foreign Patents, Copyrights, etc.; gives information on Patent Procedure; tells what every inventor should know. Thousands of Inventors, who are our clients, are our reference.

CHANDLEE & CHANDLEE, 25 Years' Experience
473 7th St. Washington, D. C.

Have You An Invention?

If so the WORLD PROGRESS will send you upon request sample copy Free containing SUGGESTIONS TO INVENTORS as to Inventions Needed. We invite manufacturers to address us regarding inventions they want.

Subscription for one year 60 cents

WORLD PROGRESS PUB. CO., Inc.

Room 203 Victor Bldg.

WASHINGTON, D. C.



United States Capitol

PATENTS

Don't Lose Your Rights To Patent Protection

Before disclosing your invention to anyone send for blank form "EVIDENCE OF CONCEPTION" to be signed and witnessed. As registered patent attorneys we represent hundreds of inventors all over the United States and Canada in the advancement of inventions. The form "Evidence of Conception," sample, instructions relating to obtaining of patents and schedule of fees sent upon request.

LANCASTER & ALLWINE

480 Ouray Bldg.

WASHINGTON, D. C.

Originators of forms "Evidence of Conception."

INVENTORS PROTECT YOUR IDEAS

Send for our Guide Book, **HOW TO GET A PATENT**, and Evidence of Invention Blank, sent free on request. Tells our terms, methods, etc. Send model or sketch and description of your invention for INSTRUCTIONS. No charge for the above information.

RANDOLPH & CO.

300 Victor Bldg., WASHINGTON, D. C.

NAME.....

STREET.....

CITY..... STATE.....

SPECIAL Values
SEND ONLY
A FULL YEAR TO PAY

WB1—Sensational Value!
New, elegant Lady's dinner ring, 18K white gold, with 3 genuine blue white diamonds, 2 French blue sapphires. **\$39.75** **\$315 a month**

WB2—Think of it! 3 genuine first quality blue white diamonds, popular design, Lady's ring, 18K white gold. **\$29.50**

WB3—Style Leader! Attractive Lady's wristwatch, 14K solid white gold case with ribbon band and white gold clasp. Highest grade, 15 jewel ruby and sapphire movement, lifetime guarantee. **\$1.67** **\$22.00** per month

WB4—The Smartest thing in a lady's ring. Genuine blue white diamond; artistically engraved and pierced. 18K white gold. **\$56.75**

WB5—Massive gentleman's ring. 14K green gold, engraved, genuine radiant blue white diamond, white gold top. **\$47.50**

WB6—Remarkable gentlemen's strap watch sale. Nationally famous Elgin strap watch, in 20-year guaranteed green gold filled case, radium **\$24.50** dial, accurate timekeeper, \$1.88 per month

ROYAL DIAMOND & WATCH CO.
ESTABLISHED 1895
ADDRESS DEPT 1803 170 BROADWAY N.Y.

TYPEWRITER PRICES CUT

World's best makes—Underwood, Remington, Oliver—prices smashed to almost half.

\$2 and it's yours

All late models, completely rebuilt and re-finished brand new. **GUARANTEED** for ten YEARS. Send no money—big FREE catalog shows actual machines in full colors. Get our direct-to-you easy payment plan and 10-day free trial offer. **Limited time, so write today.** International Typewriter Ex., 186 W. Lake St., Dept. 594, Chicago

Free Trial

PATENTS

To the Man with an Idea

I offer a comprehensive, experienced, efficient service for his prompt, legal protection and the development of his proposition.

Send sketch, or model and description, for advice as to cost, search through prior United States patents, etc. Preliminary advice gladly furnished without charge.

My experience and familiarity with various arts frequently enable me to accurately advise clients as to probable patentability before they go to any expense.

Booklet of valuable information and form for properly disclosing your idea free on request. Write today.

Richard B. Owen, Patent Lawyer
9-303 Owen Bldg., Washington, D.C.
41-E Park Row, New York City

TRADE-MARKS REGISTERED

PATENTS

Trade Marks, Copyrights, Patent Litigation Handbook with illustrations, 100 mechanical movements. Sent free on request.

ALBERT E. DIETERICH
formerly member examining corps U. S. Patent Office
PATENT LAWYER and SOLICITOR

621-A, Ouray Bldg.
27 Years' Experience Washington, D. C.

BLUE BOOK ON PATENTS

AND PRIORITY RECORD BLANK GRATIS.

MONROE E. MILLER, PATENT LAWYER
411-2 Ouray Building, WASHINGTON, D. C.
ELECTRICAL AND MECHANICAL EXPERT

INVENTORS

who derive largest profits know and heed certain simple but vital facts before applying for Patents. Our book *Patent-Sense* gives those facts; sent free. Write **LACEY & LACEY**, 646 F St., Washington, D. C. Established 1869.



Inventors and Mechanics
Send 10 cents in stamps for **Material Catalog**
COLBURN GEAR & MFG. CO.
98 Holmes St., Quincy, Mass.



MOVIES IN YOUR HOME

Write for interesting catalog of movie machines and films—Low Prices.

PILGRIM CO., DEPT. 117, MEDFORD, MASS.



Do Your PRINTING

Cards, stationery, circulars, tag, labels, paper. **Complete Outfits, \$8.85 up**, Job Presses \$11 up, Rotary \$149. Card Cutters, \$3. Save money. Print for others, big profits. All easy rules sent. Write for catalog presses, type, paper cards, ink etc. **THE KELSEY CO., P-37, Meriden, Conn.**

Swear Off Tobacco

Tobacco Habit Banished Let Us Help You

Quick Results

Trying to quit the tobacco habit unaided is often a losing fight against heavy odds, and may mean a serious shock to your nervous system. So don't try it! Make the tobacco habit quit you. It will quit you if you will just take **Tobacco Redeemer** according to directions.

It doesn't make a particle of difference whether you've been a user of tobacco for a single month or 50 years, or how much you use, or in what form you use it. Whether you smoke cigars, cigarettes, pipe, chew plug or fine cut or use snuff—**Tobacco Redeemer** will positively remove all craving for tobacco in any form in a few days. Your tobacco craving will usually begin to decrease after the very first dose—there's no long waiting for results.

Tobacco Redeemer contains no habit-forming drugs of any kind and is marvelously quick, scientific and thoroughly reliable.

Not a Substitute

Tobacco Redeemer is in no sense a substitute for tobacco, but is a radical, efficient treatment. After finishing the treatment you have absolutely no desire to use tobacco again or to continue the use of the remedy. It helps to quiet the nerves, and will make you feel better in every way. If you really want to quit the tobacco habit—get rid of it so completely that when you see others using it, it will not awaken the slightest desire in you—you should at once begin a course of **Tobacco Redeemer** treatment for the habit.

Results Absolutely Guaranteed

A single trial will convince the most skeptical. Our legal, binding, money-back guarantee goes with each full treatment. If **Tobacco Redeemer** fails to banish the tobacco habit when taken according to the plain and easy directions, your money will be cheerfully refunded upon demand.

Let Us Send You Convincing Proof

If you are a slave of the tobacco habit and want to find a sure, quick way of quitting "for keeps" you owe it to yourself and to your family to mail the coupon below or send your name and address on a postal and receive our free booklet on the deadly effect of tobacco on the human system, and positive proof that **Tobacco Redeemer** will quickly free you from the habit.

Newell Pharmacal Company
Dept. 300, Clayton Station, St. Louis Mo.

Free Book Coupon

NEWELL PHARMACAL CO.,
Dept. 300, Clayton Station, St. Louis, Mo.

Please send, without obligating me in any way, your free booklet regarding the tobacco habit and proof that **Tobacco Redeemer** will positively free me from the tobacco habit or my money will be refunded.

Name.....

Street and No.....

Town..... State.....



Tobacco Tells on
Nervous System



Tobacco Ruins
Digestion



Tobacco Stunts
Boy's Growth



Tobacco Robs
Man of Vitality



Tobacco Steals
from You the
Pleasures, Com-
forts, Luxuries
of Life



Speedway

#280

Drill & Saw Kit



\$1.00

Down and We Will Send This

Handy, efficient, machine shop, with a portable or stationary drill—a handy portable saw—a 2½" emery wheel and buffing wheel, all packed in a neat, pressed-steel case. Just the tool for your garage, workshop, or repair bench.

\$1.00 Down—10 Days' Free Trial

Pin a dollar bill to the coupon and we will ship you this No. 280 Drill and Saw Kit for 10 Days' Free Trial in your own home. \$10.00 C. O. D., balance, easy terms. If it does less than we claim for it, send it back. They're going fast—write today!

ELECTRO MAGNETIC TOOL CO., Manager, Dept. 2M2
1830 S. 52nd Ave., Cicero, Illinois



Dear Sir—Here's my dollar bill. Please ship me at once the handy Speedway Drill and Saw Kit. I will pay \$10.00 on delivery, \$12.50 in 30 days, and \$12.50 in 60 days; total cost to me, \$36.00.

Name.....

Address.....

City.....State.....

FROST-RADIO

NOTHING FINER AT ANY PRICE

Your money cannot buy finer quality than Frost-Radio Metal Frame and Bakelite Rheostats offer you. Finest grade resistance wire cannot burn out. Bakelite pointer knob. Smooth working action. Single hole mounting. Supplied in wide range of resistances from 2½ to 75 ohms. Metal Frame type 50c. Bakelite type 75c. Your dealer has them.



HERBERT H. FROST, Inc.

160 N. La Salle St.
CHICAGO



New York
Los Angeles

Mail
Coupon
For Our
Literature

HERBERT H. FROST, Inc., 160 North La Salle Street, Chicago.
Send me literature about your rheostats as advertised in Popular Mechanics.

Name.....

Address.....

City.....State.....

\$1 GET DISTANCE

Amazing Discovery for Any Radio

Why confine your radio programs to a few local stations when the expensive concerts, dance music and lectures of hundreds of big cities are ready for you? With every order for our treatise "The Distance Getter," we give our wonderful new Distance Transformer. Tune your set according to our special instructions and presto—note the distant stations roll in!

SATISFACTION GUARANTEED

Your money instantly refunded if you are not satisfied. The attachment furnished with the "Distance Cutter" alone is worth the price. Galloway of Chicago writes: "Results beyond all expectations. Cuts through locals like a knife."

MAIL COUPON TODAY

Hazleton Laboratories,
4554 Malden St., Dept. 231, Chicago

- ☐ Send me "The Distance Getter" postpaid.
Inclosed find \$1 (M. O., stamps or check).
☐ Send C. O. D., plus small postage added.

Name.....

Address.....

City.....State.....



HERE IT IS!

Marvelous Townsend
"B" ELIMINATOR
(Complete)

only
4.95
\$1.00 down
Balance C.O.D.



Direct From Factory at Lowest Price on Record

Great news! For half the price of a set of "B" batteries you can now enjoy greatly improved reception and be done with unreliable "B" batteries. We make the Townsend "B" Eliminator complete in our own factory. That's the reason we can give you at such a remarkably low price a high quality instrument backed by a real guarantee. Users report splendid results. A fine "B" Eliminator at the lowest price on record. Our 10 days Free Trial proves it.

10 Days FREE TRIAL
You are the Judge!

MONEY BACK—If Not Amazed and Delighted

You alone are the judge. We could not afford to make this guarantee if we were not sure of the Townsend "B" Eliminator's splendid performance. Delivers up to 100 volts on any set, on direct or alternating current—any cycle. Gives full wave rectification. Full tone, clarity and volume.

Rush Order Today Simply put your name and address on a piece of paper, pin a \$1 bill to it and get it into the mail at once. Your "B" Eliminator will be sent you promptly. Deposit only \$3.95 plus postage with the postman. Try out for ten days—then if not thrilled by improvement in operation, return Eliminator to us and purchase price will be refunded in full. You don't need to put up with battery nuisance another day when it is possible to own a "B" Eliminator at this startlingly low price. Send for it today.

Townsend Laboratories, 713 Townsend Street, Dept. 15, Chicago, Ill.

BURGESS

RADIO BATTERIES

RADIO PANELS OF GENUINE BAKELITE

Cut, drilled and engraved to order. Send rough sketch for estimate. Our complete Catalog on Panels, Tubes and Rods—all genuine Bakelite—mailed on request.

STARRETT MFG. CO. 524 S. Green St.
Chicago, Ill.

INDISPENSIBLE

for 100% Tube Efficiency

Only Amperite supplies automatically the self-adjusting filament current your tubes require. Eliminates hand rheostats. Simplifies wiring. Insist on Amperite. Accept nothing else. Price \$1.10 complete. Sold everywhere. Write for Free Hook-Ups and construction data to Dept. P. M. S.



RADIALL COMPANY
50 Franklin St., NEW YORK CITY

AMPERITE

REG. U.S. PAT. OFF.

The "SELF-ADJUSTING" Rheostat

Blue Ribbon **5 TUBE NEODYNE**
RADIO KIT-COMplete

Only \$16.95

FREE!
GENUINE 20 INCH
ERLA CONE
LOUD SPEAKER &
5 TUBES

Can be built in 2 hours

COAST TO COAST RECEPTION

Latest 5 tube circuit designed by one of the foremost radio engineers in the country. Clear and realistic reception guaranteed. Solid bakelite panel and sub-panel. Panel beautifully engraved. Sub-base marked for all connections. 2 dial control; Kurz-Kasch bakelite indicator knobs. New type UX sockets. Low ratio transformers for improved tone quality. All hook-up wire and colored battery cable included. Tubes are 201-A type, tested and matched. Value \$60, our price \$16.95.

Complete Set of Simple Plans and Directions to Build
Very easy to build this set with the plans and instruction we furnish. No complicated drawings. Can be built in 2 hours. Instructions for operation included. Make money by building these sets in your spare time and selling them to your friends.

MAKE MONEY IN YOUR SPARE TIME!

SEND NO MONEY
Just write your name and address on a post card and ask us to send you this great kit together with the Erla Cone loud speaker and 5 tubes. We will ship them right away. When they arrive, pay only \$16.95, plus a small delivery charge. **RADIO EQUIPMENT CO., Dept. P, 748 N. Clark St., Chicago, Ill.**

Tube Vulcanizer
\$2.75

Pat. Applied for

Complete with necessary material to make 50 repairs, and Directions

Any flat-iron in combination with the Rex Home Outfit will vulcanize any size blow-out just as efficiently as can be done on machinery used by factories or tire repair shops.

Works with electrical or sad-iron. Does not injure iron or tube. Operating cost very low. This highly desirable vulcanizing outfit was given a long time test in our laboratories before offering it for general use.

Render a real economical service. A deposit of \$1.00 required on all C. O. D. orders.

REX MANUFACTURING COMPANY
ELIZABETH, N. J.

\$12 in 60 Minutes

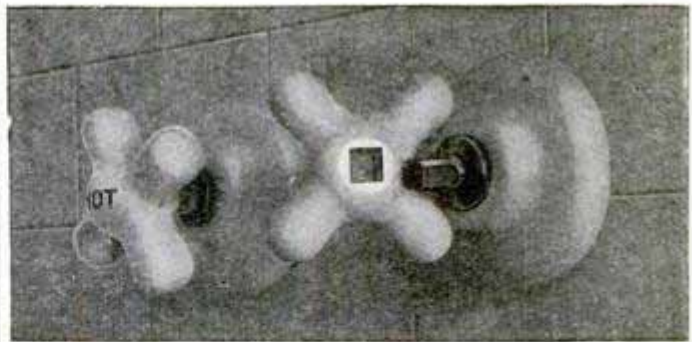
Stick-a-lite means \$270 cash profits in 9 days for Hunt. I'll tell you how he did it. How Crossman made \$3000 in 4 months last summer. How hundreds of Stick-a-lite agents made from \$12 an hour up to \$200 a week. I am prepared to guarantee you **BIG PROFITS** if you hustle.

STICK-A-LITE

Magnet-in-base Auto Light

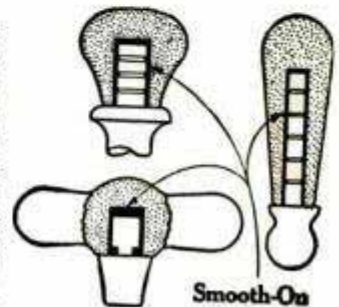
No selling talk needed to sell these wonder lamps. Takes a 30-second demonstration to put \$1.50 profit in your pocket. You don't need an auto—use the customer's own car. Show how Stick-a-lite sticks with an 8-pound grip at any angle, on any iron part of car, leaving both hands free to work. Sell every auto driver. Big season ahead. To save time, send \$2 deposit for demonstrator. Money back if returned in 15 days. Or write for Free Stick-a-lite offer, quick!

Premier Electric Company
Dept. 149, Grace St. at Ravenswood, Chicago



Porcelain handles will STAY tight if set with SMOOTH-ON No. 1

To make porcelain handles tight on bath tub and wash bowl faucets, and on sink and flush tank pulls, fill the hole in the handle with a soft putty of Smooth-On No. 1, and then force the handle onto its spindle. Once the Smooth-On hardens, it becomes solid metallic iron, which will keep the handle tight for all time. You yourself can make this repair equal to a professional job and at a cost of only a few cents.



Keep Smooth-On handy and you can save much money on such repairs as: Stopping leaks in steam, water, gas, oil or stove pipes, mending cracks, breaks or leaks in furnaces and boilers, radiators, tanks, sinks, pots and pails, making loose handles tight on umbrellas, knives, hammers, brushes, drawers, etc., tightening loose screws, hooks, locks, door knobs, etc.

Use it also on your car for making bursted water jackets and pumps good as new, stopping leaks in radiator, hose connections, gas tank and gas, oil and exhaust lines, making a fume-proof joint between exhaust pipe and tonneau heater, tightening loose headlight posts, keeping grease cups, hub caps and nuts from loosening, etc.

Get Smooth-On No. 1 in 7-oz., 1 lb. or 5-lb. tins at any hardware store or if necessary direct from us. If you want us to send a sample 7-oz. can, enclose 35 cts. in stamps when you return the coupon.

SMOOTH-ON MFG. CO.
Dept. 37, 574 Communipaw Ave.
JERSEY CITY, N. J.

How to make HOME-AUTOMOBILE REPAIRS

Do it with SMOOTH-ON

Write for FREE BOOK



Do it with SMOOTH-ON

SMOOTH-ON MFG. CO., Dept. 37,
574 Communipaw Ave., Jersey City, N. J.
Please send the free Smooth-On Repair Book.

Name.....

Address.....



**Want
to
make
more
money
?
Be a
Civil
Engi-
neer**

Here is an easy way to learn. You hold your future in your own hands. If you have a grammar school education, and want the advantages of knowledge usually gained in college, you will welcome this new system of reading at home. No long hours of grinding study; just the meat of every subject told in such a simple way that anybody can understand. These books were prepared by men who are experts, they are full of boiled down facts and easily learned methods which save time and study. Civil Engineers are more important than ever; steel buildings, bridges, highways, railroads and harbor projects make Engineering more important than almost any other profession.

**If you want to get ahead—try this easy way
We Ship Nine Books FREE**

This is a "straight-from-the-shoulder" offer to men who want a big future. If you could hear half the stories of success we receive, you would not hesitate a minute. Send for the books now; just your name and address; and we'll ship the entire set of nine volumes. Keep them ten days, then if you realize how valuable they are to you, send only \$2.00, and after that only \$3.00 per month until the small total of only \$34.80 is paid. A membership in the American Technical Society will be included without any cost to you if you send NOW. This entitles you to full consultation privileges with 18 engineering experts.

The special jiffy index puts facts at your finger tips

AMERICAN TECHNICAL SOCIETY, Dept. C-519, Chicago
You may send me, for Free examination, your nine new books on Civil Engineering. Unless I return them in ten days I will send you \$2.00 as first payment, then \$3.00 per month until the special price of only \$34.80 is paid. Include membership in the American Technical Society.

Name
Address
City State
References

COLLAPSIBLE HAT AND COAT HANGER



Something entirely new and we don't see how you can do without this useful article for your home, office or factory. Holds four hats and four coats. Put up with two screws made of steel. Send \$1.00 for sample oxidized finish. Satisfaction guaranteed or money back without question.

B. D. GAUSE MFG. CO., ELKHART, IND.

New Improved SPORS Fountain Pen. 60 Day Trial. Money back if not pleased

Agents' Sample **65c** Sells for \$1.25. Writes like a \$7 Pen
Make \$10 Daily Easily

LADIES' OR MEN'S STYLE
Comes in Red or Green
**GUARANTEED
2 YEARS**

Improved Point



F. SPORS CO.

**Only
\$5⁵⁰**

**Brings
You a
Genuine**

**BUCKSKIN
JACKET**

TRADE MARK. REG. U.S. PAT. OFF.

YOUR money back if it fades—shrinks—or loses its fine texture. Roomy, comfortable. Looks like buckskin, feels like suede, wears like leather. Strong, double-stitched seams. Over-size, button-through flap pockets. Adjustable two-button cuffs. Springy, knitted belt. Buckskin tan color. Send \$5.50 and your collar size to

care **Lustberg Nast & Co.**

Dept. B-5, 331 Broadway, New York City

Buck Skin For **Look for the Buck and Guarantee Bond**
FREE PICTURE CATALOG—Write for "Buck Skin Joe's Family Album," showing Buck Skin Jackets and Shirts, also the Glorified Lumberjack Buck Jack.

Will Finance Patents

"Patents of commercial value financed on royalty basis without expense to inventor. Mail models and copies of patents or full details to

KAMSTONE HOLDING CORP.

41 East 42nd Street

N. Y. C.



U. S. HEADQUARTERS

Mauser & Luger Carbines

Wheley Air Pistols, Rifles, Shotguns,
Merke Bros. Over and under Trap-
guns. Mannlicher-Schoenauer Ammu-
nition. 72 PAGE ILL. CATALOG 25c.

A. F. STOEGER, Inc.
224 East 42nd St., New York

Great New Invention

**for Seekers of Health—Power—Beauty
Elco Electric Health Generator**



Generates High Frequency Violet Ray, Mechanical Vibration
Medical Electricity, and Ozone. Four of Nature's Greatest
Curative Agents. For Home Treatments at less than 50
cents per year.

FREE BOOK "Health, Power, Beauty" describing this
Great New Invention. Re-vitalize your-
self. Bring back energy. Be wholly alive. Write today.

Lindstrom & Co., 30 W. Lake St., Dept. 13-55, Chicago

**MAKES \$8.40
IN TEN MINUTES**

I sold my dozen pens in about 10 minutes. Will
order another dozen soon. **TRACY KRENZ, Nebraska.**
Write for **FREE Wholesale Specialty Catalog.**
227 MAIN ST. **LESUEUR CENTER, MINN.**

WAGE EARNER OR BUSINESS MAN?

Five to ten dollars a day—and work uncertain—or three times that income and a steady constantly growing business. Which?—
As a Floor Surfacing Contractor with the

American Universal FLOOR SURFACING MACHINE

you control your own time and own your own business. Surfacing of new floors and resurfacing of old is a big, established industry. It is inside, pleasant work. Requires no long period of study or training. It is a year round business. No dull seasons. No large capital required. There is more work to do than there are operators to do it.

The American Universal is electrically operated — scientifically built by the oldest and most successful Floor Machine Company in existence. It offers a big money-making opportunity to the man who wants to own his own business. Write for details.

The American Floor Surfacing Machine Co.

523 South St. Clair Street, Toledo, Ohio

The American Floor Surfacing Machine Co.,
523 So. St. Clair St., Toledo, Ohio.

Please send me, without obligation on my part, full information about the "American Universal" Floor Surfacing Machine.

Name

Street

City State



To all Gem-Lovers answering this ad we will send this month **ABSOLUTELY FREE**, all charges prepaid, a one carat perfect cut and polished **CALIFORNIA ROSE DIAMOND** of exquisite beauty. We do this to advertise our marvelous **NEW GEM** the **CALIFORNIA STEEL BLUE DIAMOND**, not a genuine diamond but positively matching **SIDE BY SIDE** the finest \$500.00 first water diamond in cut-brilliance, and dazzling rainbow fire. Amazingly low in price, brilliancy guaranteed for life. Mail postal today for **FREE GEM** and actual photos of Steel Blue Diamond. California Diamond Co., Dept. 12 Monterey, Cal.

FORDS No Freezing and No Boiling Plus Great Gas Saving. AIRLOCK

does it absolutely. Sells like machine guns fire. Free trial always. Fords demonstrating make \$50 daily.

AIRLOCK PRODUCTS CO., Box 588A, BURNETT, CALIFORNIA

If You Are A MAN

worthy of the name and not afraid to work, I'll bet you \$50 that you can't work for us 30 days and earn less than \$200. Think I'm bluffing? Then answer this ad and show me up. Openings for managers. The "Wonder Box" sells on sight.

TOM WALKER
DEPT. 25 • PITTSBURGH, PA.

RADIO GREATEST RADIO BARGAIN \$18.45



in U. S. 5-Tube Chassis

Coast to coast reception. Certified circuit. Dealers write for special proposition. AGENTS WANTED. Write today for folder.

A. J. MUSSELMAN, Inc.
237 Machinery Hall CHICAGO, ILL.

Let Boice Help You Build It!

Send now for 64-page catalog and learn what you can do with Boice's low-cost machines.

Boice-Crane Bench Machines

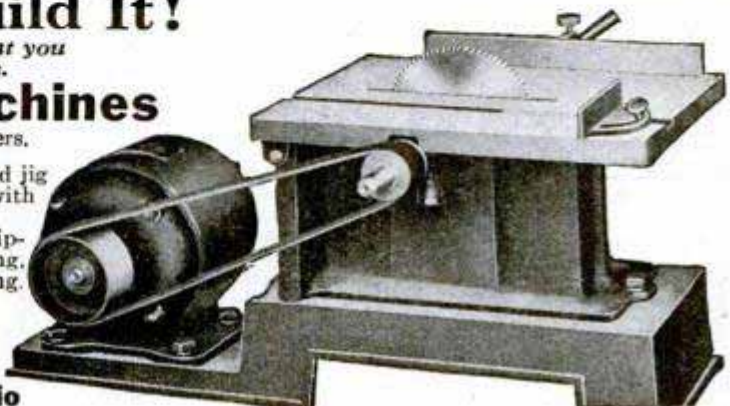
Includes a complete line of circular, band and jig saws, mortisers, jointers, lathes and drills.

8' Bench Lathe does turning, drilling, sanding, grinding and jig sawing in wood or soft metal. Compound side rest furnished with metal-working model.

Handisaw shown does ripping, mitering, grooving, sanding, drilling, moulding. Does 2 1/4" x 3 1/4".

Boice machines driven by 1/4 to 1/2 h. p. motor attached to light socket. Machines sold with or without motor.

W. B. & J. E. BOICE, Dept. P.M. 5-C, Toledo, Ohio



LOFTIS BROS. & CO.
108 N. State St. Chicago, Ill.
Dept. N-894
Diamond Catalog Free:
132 Pages of bargains
in Diamonds, Watches,
Silverware, Clocks,
Ivory Goods, and
gift articles
for all occa-
sions.

diamonds
GENUINE — GUARANTEED

CASH OR CREDIT

Quality Gifts

The Quality Diamond Gift is the most prized of all. Every article we sell is of finest grade. You always get the best value from Loftis. Satisfaction guaranteed or money back. The Diamond Rings shown here are exquisite creations in Solid 18-karat White Gold, set with sparkling blue white Diamonds of fiery radiance. Any ring sent for your free examination on request.

Credit Terms: Pay one-tenth down balance in weekly, semi-monthly, or monthly terms at your convenience. All goods delivered on first payment. Our References: Any Bank in the U. S. A.

Railroad Watches—Guaranteed to Pass Inspection

HAMILTON NO. 992. 21 Jewels, Adjusted to 5 Positions. Gold filled. 25-Year Case. **\$55**

ELGIN'S LATEST RAYMOND. 21 Jewels, 8 Adjustments. Runs 40 hours one winding. Gold filled 20-Year Case. **\$55**

ILLINOIS "BUNN SPECIAL." 21 Jewels, Adjusted to 3 Positions. Gold filled 25-Year Case. 60 hrs. 1 winding. **\$50**

19-Jewel Adjusted Waltham No. 846—14-k white gold filled; assorted patterns, \$42.50 \$4.25 down and \$1.00 a week

We carry all standard makes of Railroad Watches—guaranteed to pass inspection. Credit at Cash Prices.

Wrist Watch No. 16—14-k white gold. High grade 15-Jewel movement, \$14.85. \$1.48 a month down and..... 1 month

Cushion Strap Watch, nickel, 6 Jewels—high grade Leather strap. Special \$9.95

Wedding Rings

No. 824—The "Elite" 18-k white \$750 gold.....

Set with 3 Diamonds, \$22.50; 5 Diamonds, \$32.50; 7 Diamonds, \$42.50; 9 Diamonds, \$52.50; 12 Diamonds, \$67.50. All platinum, \$25. With 3 Diamonds, \$50; 5 Diamonds \$70; 7 Diamonds \$80; 9 Diamonds, \$100; circled by Diamonds, \$200.

I made \$93 my first week

"Since then I have earned over \$100 every week," says S. L. Patterson, of Iowa.

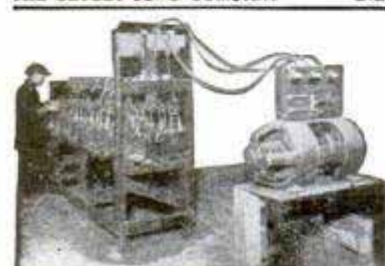
NEW! GRAB THIS FREE OUTFIT QUICK!

Many others making big money. No wonder! Millions of interested prospects. A quality product. Puts lasting crease in trousers. Takes out bagginess—smoothes entire surface—demonstrates in 40 seconds. Sells quick to every man. Quick, easy profit!

FREE Selling Outfit

Your profits paid in advance. Simply write orders. We deliver and collect. Test it without cost, full time or side line. Send postcard for offer of free demonstrator. Join the big money-makers. Write today.

THE GETGEY-JUNG COMPANY E121 G-J Bldg. Cincinnati, Ohio



ONE DAY BATTERY CHARGING PAYS BIG YOU CAN CLEAR \$150 to \$300 MONTHLY PROFITS

Thousands of HB users are making big profits every month. Every car owner and radio owner wants quick, reliable One Day Charging. Get their business with an HB One Day Battery Charger. Small cash payment brings you complete outfit on 30 days' trial with money back guarantee. Only \$16.50 monthly pays for your HB, easily made many times over by your increased battery charging business. Get an HB now. Start making \$150 to \$300 clear monthly profits. Write for free bulletin 326.

HOBART BROS. CO. Box M57 TROY, OHIO

MAKE YOURS THE SHOP WITH HB ONE DAY BATTERY CHARGING

Button Rupture Newest Way [Without Pressure]



Science now advises discarding cruel steel springs, barbarous leg straps, and other harness that press against the rupture and thus prevent nature from healing it. A new sensible method has been perfected, after thousands of test cases, called Magic Dot—entirely different from any other way. Instead of "pressing," it "seals" rupture, and of course allows users to run, jump, bend and cough in perfect safety.

Breathes Air

With this 1-25th oz. device is a new kind of pad, air-porous and washable. It actually breathes air, and cannot slip off the rupture—a feature, you'll frankly admit, that is lacking in your present appliance. In fact, it is so superior and different that it is praised by physicians as "an entirely new departure." Users report they have forgotten they are wearing it. But don't buy it yet.

See It First

By a special arrangement, you can now have it sent to your home without obligation to wear it. Don't send a penny or order it now. Just write for full description of Magic Dot and details of this unusual "no obligation" offer. Tear out this ad now and write today, for quick relief.

NEW SCIENCE INSTITUTE
2136 Clay St., Steubenville, Ohio

Save Your Feet

When all else fails, end your suffering with the

Heefner Arch Support

No Metal

Fully patented. It re-adjusts the entire foot. Write for free book and statements from doctors and users.

Heefner Arch Support Co. 651 M. E. Taylor Bldg. Louisville, Ky.

A PERFECT LOOKING NOSE
Can Easily Be Yours

Trados Model No. 25 corrects now ill-shaped noses quickly, painlessly, permanently and comfortably at home (excepting cases caused by improper bone structure). It is a safe and guaranteed patent device of precise adjustment that will actually give you a perfect looking nose. Over 90,000 satisfied users. For years recommended by physicians. 16 years of experience in manufacturing Nose Shapers is at your service. Model 25 Junior for children. Write for testimonials and free booklet, which tells you how to obtain a perfect looking nose.

M. TRILETY, Pioneer Noseshaaping Specialist
Dept. 2792 Binghamton, N. Y.



GOODELL-PRATT



Inside Micrometer—618. Gauges the precise diameter of any automobile cylinder from 2 to 6 inches, showing maximum—for re-boring or grinding. Extra rods are inserted for diameters above 2 inches. Barrel clearly etched and easy to read. Extra rods carried in hollow handle. Long handle reaches where hand cannot. Hardened steel anvils adjustable to compensate for wear. Complete, \$12



Outside Spring Calipers—500. For transferring measurements to steel rule. Every part subject to wear is hardened. Legs are hard crucible steel. Stiff, properly tempered springs. Extra-long screw gives greater measuring capacity. Size 2½ inches. With Solid Nut. . . \$0.95



Feeler Gauge—359. For gauging gaps, as in spark plugs, platinum points and valve tappets, etc. 9 leaves, 2½ inches long—½ inch wide. .0015 to .015. Used in combination, these will measure any gap from .0015 to .0615. . . \$1.80

Steel Rule—213. Light Tempered. 6 x ¾ x 1/20 inches. Clearly graduated both sides and ends. Accurate in between as well as over all. . . \$1

Micrometer Depth Gauge—31-R. With 3 rods, for measuring slots, holes, etc., from 0 to 3 inches, by 1/1000ths. Ratchet mechanism. Base 2½ in. x 1 11/32 in., hardened, ground and accurately lapped at right angles to rods. . . \$11



GOODELL-PRATT



Valve Lifter—596. All-steel. Powerful enough to compress and hold any valve springs. Jaws move on hardened rollers. Screw turns on ball bearings. Takes positive hold; doesn't slip or catch fingers. Nicely polished. . . \$2.75

Valve Grinder—288. Takes the drudgery out of the job of grinding valves. Crank turns in one direction as on hand drill, but spindle oscillates back and forth. Enamelled iron frame. Over all length 10¼ inches. Weight 3¼ pounds. . . \$4



Goodell-Pratt Electric Drills. Sizes ¼ to ¾ inch. Light and Heavy Duty, for 110 and 220 A.C. or D.C. Steady drilling doesn't overheat these drills. Self-oiling bearings require only occasional attention. Vital parts readily accessible. These drills retail from . . . \$36 to \$99

Mechanic's Vise—370. Tough steel jaw faces, scored and case-hardened, 3 x 1½ inches, opening 4¼ inches. Steel Feed Screw with square thread, and 1½ inch guide rods, insure great rigidity. Iron parts red and black enameled; steel parts polished. Weight 40 pounds. \$16

Micrometer Caliper—2-R. Measures diameters up to 1 inch by 1/1000ths. Drop-forged frame; ratchet mechanism; locking device to hold screw at any desired position. Compensation for wear provided. . . \$12



THE ten automobile repair tools pictured here are single examples of the sizes in which each is made. The catalog also features all kinds of tools for machinists, and professional and amateur mechanics.

Tools that speed up automobile repair work

You'll find them all in this free
400-page catalog

VALVE LIFTERS—that raise and hold positively—never slip or catch fingers. **Valve Grinders**—that make valve-grinding as easy as hand drilling, and lift your fingers clear of the vertical cylinder-head bolts. **Feeler Gauges**—that take the guesswork out of spark-plug, platinum-point and valve-tappet adjustments.

Electric Drills that drill steadily hour after hour on the most gruelling job, without distress or overheating. The ¼-inch Heavy Duty

Goodell-Pratt Electric Drill goes through ½-inch cold rolled steel in 13 seconds. **Precision Tools**—that tell depths and diameters, lengths and outside measurements, accurately, to the thousandth of an inch.

These and many more good automotive tools are pictured and described in the Goodell-Pratt 400-page Catalog shown above.

Some of these tools will be new to you—will show you quicker, more convenient ways in automobile repairs and adjustments. These tools are sold by good hardware stores, mill supply houses and automotive supply dealers. The catalog is free. Write for it. Select the tools you want. Then see your dealer.

GOODELL-PRATT COMPANY, GREENFIELD, MASS., U. S. A.

MAKERS OF *Toolsmiths* MR. PUNCH

GOODELL-PRATT

1500 GOOD TOOLS

Learn to Play This for Real Fun-Money

Have fun. Be Popular. Make real money in your spare time. Easy! When you learn to play a

BUESCHER

True Tone Saxophone

If you can whistle a tune you can learn to play a Buescher. 3 lessons given on request with each Buescher Sax' give you quick, easy start. Many learn scales first hour, play tunes first week, with their Bueschers.

Easy to Play — Easy to Pay

Take any Buescher Instrument home for six days' trial. See what you can do. If you decide to keep it, pay a little each month. Send for Beautiful Catalog and details of this liberal plan. No obligation. Mail the coupon today.

BUESCHER BAND INSTRUMENT CO.
Everything in Band and Orchestra Instruments

2010 Buescher Block Elkhart, Indiana



BUESCHER BAND INSTRUMENT CO. 383
2010 Buescher Block, Elkhart, Ind.

Gentlemen: Without obligating me in any way please send me your free literature. Mention instrument interested in.

Age?.....Name instrument.....

Name.....

Address.....

SEND FOR
FREE BOOK

FREE TRIAL Grows Hair

**AMAZING NEW
ELECTRICAL
DISCOVERY**

A noted surgeon has discovered an amazing way to grow hair, called Dermo-Ray. In 30 days no more dandruff. Scalp tissues are given new life. Then within a few weeks, luxuriant new hair! The startling discovery of the almost magic effect of Infra-Red Rays on the hair-growing tissues was made by a leading surgeon. Two years ago he was himself bald. Today his hair is full and thick.

FAMOUS SURGEON'S DISCOVERY

Here is his own personal, home treatment, called Dermo-Ray. At last a home method endorsed by science. **Guaranteed to bring you these same results in 30 days—or you pay nothing.** You can use Dermo-Ray in any home with electricity. The warm, soothing Infra-Red Rays vitalize the scalp while you rest—a few minutes each day is all the time required.

SEND NO MONEY Complete facts about this astounding new scientific discovery, opinions of authorities, incontrovertible evidence, and details of **special trial offer** sent free, if you mail the coupon below. To end your scalp and hair troubles, act at once. Print your name and address plainly—and mail the coupon NOW!

-----**FREE TRIAL OFFER**-----

The Larson Institute
Michigan Ave. at Lake St., Dept. 27, Chicago, Ill.

Send me at once, without obligation, full particulars—in plain envelope—of your 30-day Free Trial of DERMO-RAY.

Name.....

Address.....

City.....State.....

FREE!

This Book
on ~
**NEW & USED
AUTO PARTS**
SAVE 30 to 80%!



GET this 80-page Book of Bargains FREE! The largest, most complete book of its kind ever printed. Quantity buying and big-volume selling enable us to offer nationally advertised Auto Parts at rock-bottom prices—less than regular wholesale! Everything for the auto at a 30 to 80% saving!

Timken Axles and Bearings, Brown-Lipe Transmissions, Pistons, Rings, Hayes and Firestone Wheels, Rims, Tires, Tubes and a complete line of accessories—new, except where specified.

We have the largest stock in the world of new and used replacement parts. Write us FIRST—we have many parts impossible to get elsewhere.

Write for Your Catalogue Today—FREE!

WARSHAWSKY & Co.
World's Largest Replacement Parts House
1915-35 S. State St. Dept. PM-4 CHICAGO, ILL.



Elvacut

**The Wonder Electric
Lawn Mower**

As easy to use as a vacuum cleaner. Very light, fast and a smooth cutter. The hard work of grass cutting becomes a real pleasure as electricity furnishes the power at a cost of 2 or 3 cents per hour. Circular on Request.

ELVACUT SALES
38 York Terrace, Brookline, Mass.

SKIN-TROUBLES

ANDRE'S ACNE CREAM is Excellent for all Skin Troubles no matter how severe or chronic. Pimples, Blackheads, Eruptions on face or body. Eczema, Barbers' Itch, Scabs, Crusts, Pustules, Enlarged Pores, Oily, Shiny or Itching Skin. Lightens Freckles, softens and whitens the skin. Immediate Results. Write for full particulars.

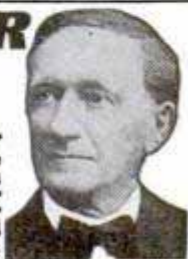
Andre & Co., 4029 Cottage Grove Av. Suite 451, Chicago, Ill.

**DON'T WEAR
A TRUSS**

BE COMFORTABLE—

Wear the Brooks Appliance, the modern scientific invention which gives rupture sufferers immediate relief. It has no obnoxious springs or pads. Automatic Air Cushions bind and draw together the broken parts. No salves or plasters. Durable. Cheap. Sent on trial to prove its worth. Beware of imitations. Look for trade-mark bearing portrait and signature of C. E. Brooks which appears on every Appliance. None other genuine. Full information and booklet sent free in plain, sealed envelope.

BROOKS APPLIANCE CO., 107 State St., Marshall, Mich.



MR. C. E. BROOKS

Again in 1926 Keds are worn by winners of 13 National Championships . .

A SOARING lob to the baseline, arching up over the lithe figure which sprints back to save set point. . . . A smash returned by flinging the body aside and driving while still in the air . . .

At any cost for footwear these champions would have increased their speed, their sure footedness by even a fraction.

They bought Keds.

Champions in a dozen different sports, thousands of boys in their contests and in everyday wear constantly prove the wisdom of their choice.

The same styles of Keds that were available to these Champions, are now

available to you. Crepe soles, corrugated soles; high or low; for men, women, and children, for sports or everyday wear.

To stand the strain of modern sports, Keds uppers are skillfully made of fine canvas, with sturdy reinforcements at points of stress. Special Feltex inner soles keep feet cool in the heat of the fastest game.

And Keds wear and wear, frequently cutting dollars from your summer shoe bill. Their prices range from \$1.25 to \$4.50. Genuine Keds are made only by

United States Rubber Company



THE "CONQUEST"

—crepe soles

This Keds model with vulcanized crepe rubber sole gives sure grip and wonderful wear. White or brown

THE "TRIUMPH"

A popular Keds model with vulcanized crepe rubber soles. A favorite, worn by nearly all the great tennis players



1926 Championships won on Keds

National Clay Court Singles
National Veterans' Singles
Intercollegiate Singles
Intercollegiate Doubles
National Indoor Doubles
U. S. Wightman Cup Team
National Women's Singles
National Women's Doubles

National Boys' Singles
National Boys' Doubles
National Women's Indoor
Singles
National Women's Indoor
Doubles
National Boys' Indoor
Singles



They are not **Keds** unless the name Keds is on the shoe



Turn Your Spare Hours Into Real Money

HAVEN'T you often wished for a spare-time way of making more money than comes in the regular pay envelope? Of the various ways which present themselves none is more pleasant or profitable than playing engagements in a Band or Orchestra.

Send the Coupon
For particulars of our easy Payment Plan that tells how you can "Pay While You Play."

Free Trial—We want you to try out a King in your own home, without obligation and if you do not find the King the very best instrument you ever played—return it.

Trade-In Proposition—Turn in the instrument you now own as part payment on a new King. Our latest catalogs show many new model Kings and tell why they are the best instruments to learn on and play on.

Use the coupon to order your copy.

THE H. N. WHITE CO.
5211-87 Superior Ave., Cleveland, O.

Instrument _____
Name _____
Address _____
City _____ State _____

Wait Just a Moment, Mr.!

Before You Light That Cigarette, Cigar or Pipe—Or Take a Chew of Tobacco—

REMEMBER THIS:

That no man can escape the bad effects of tobacco. Its active principal—nicotine—is a *deadly poison* which, in time, is simply bound to injure your health—perhaps seriously.

Most tobacco users realize this. But when they try to quit unaided they find it next to impossible because of the almost unbreakable hold the habit has on them.

Thousands of inveterate tobacco users have found it easy to quit with the aid of the



Keeley Home Treatment For the Tobacco Habit

A sane, scientific Treatment based on the prescription of Dr. Keeley, who founded the famous Keeley Institute for liquor, drug and tobacco addicts more than 50 years ago. Quickly and completely banishes all craving for tobacco in any form. Contains no habit-forming drugs. No bad after-effects. Not a tobacco substitute. A wonderful tonic. Improves appetite and digestion.

Money-Back Guarantee If, after taking this Treatment according to directions you can honestly say you have not been benefited, we will refund your money.

MAIL COUPON for FREE BOOK which gives plain facts about the injurious effects of tobacco and tells how easy it is to quit with the aid of this remarkable treatment.

THE KEELEY INSTITUTE

Dept. P. M.-5 DWIGHT, ILL.


The Keeley Institute, Dept. P.M.-5, Dwight, Ill.

Send without obligation your free booklet telling how to rid myself of the tobacco habit.

Name

Address

21 Jewel Burlington



Only \$1.00 Down

The 21-Jewel Burlington is sold to you at a very low price and on the very special terms of \$1.00 down — free examination — small monthly payments.

Free Book Send for the most complete watch book ever produced. 100 designs and engravings in colors. Write for it today. It is free. A postcard will do.

BURLINGTON WATCH CO. 19th St. & Marshall Blvd. Dept. 13-55 CHICAGO

Oh Boy! See All!

Big 3 1/2 Ft. Telescope

Lend wings to your eyes! People and objects miles away seem close. Wonder telescope brings new pleasures to home, farm, camp, travel, sport. Study the mysterious Sun spots; see Moon and Stars as never before. See people on the beach, on the mountains, etc.

FREE Yes, absolutely free! A handsome leatherette Carrying Case and Shoulder Strap. Also Solar Eye Piece to view the sun—a special feature—found only on expensive instruments.

5 Sections
8 Power Lenses
Brass bound; measures 12 in. closed; powerful achromatic lenses

protected by dust caps.

Thousands Pleased

P. Brush wrote: "Watched submarines three miles off coast." Ed. Foster: "Tall time on clock five miles away." C. Scribner: "See lighthouse 15 miles away." Mrs. Yarbrough: "Could tell color of aeroplane four miles away." S. M. Gearhart: "Can see men working seven miles away." A. R. Walker: "Would not take \$10 for it."

SEND NO MONEY
On delivery of Telescope, free Case and Eye Piece pay Postman only \$1.85, plus postage. (2 complete outfits \$3.50.) Satisfaction guaranteed or money refunded. Send today, entertain your friends!

FERRY & CO., Dept. 2775, Chicago, U.S.A.

STOP USING A TRUSS



STUART'S PLAPAO-PADS are different from the truss, being mechanico-chemico applicators made self-adhesive purposely to hold the distended muscles securely in place. No straps, buckles or spring attached—cannot slip, so cannot chafe or press against the pubic bone. Thousands have successfully treated themselves at home without hindrance from work—most obstinate cases conquered. Soft as velvet—easy to apply—inexpensive. Awarded Gold Medal and Grand Prix. Process of recovery is natural, so afterwards no further use for trusses. We prove it by sending Trial of Plapao absolutely **FREE**. Write name on Coupon and send TODAY.

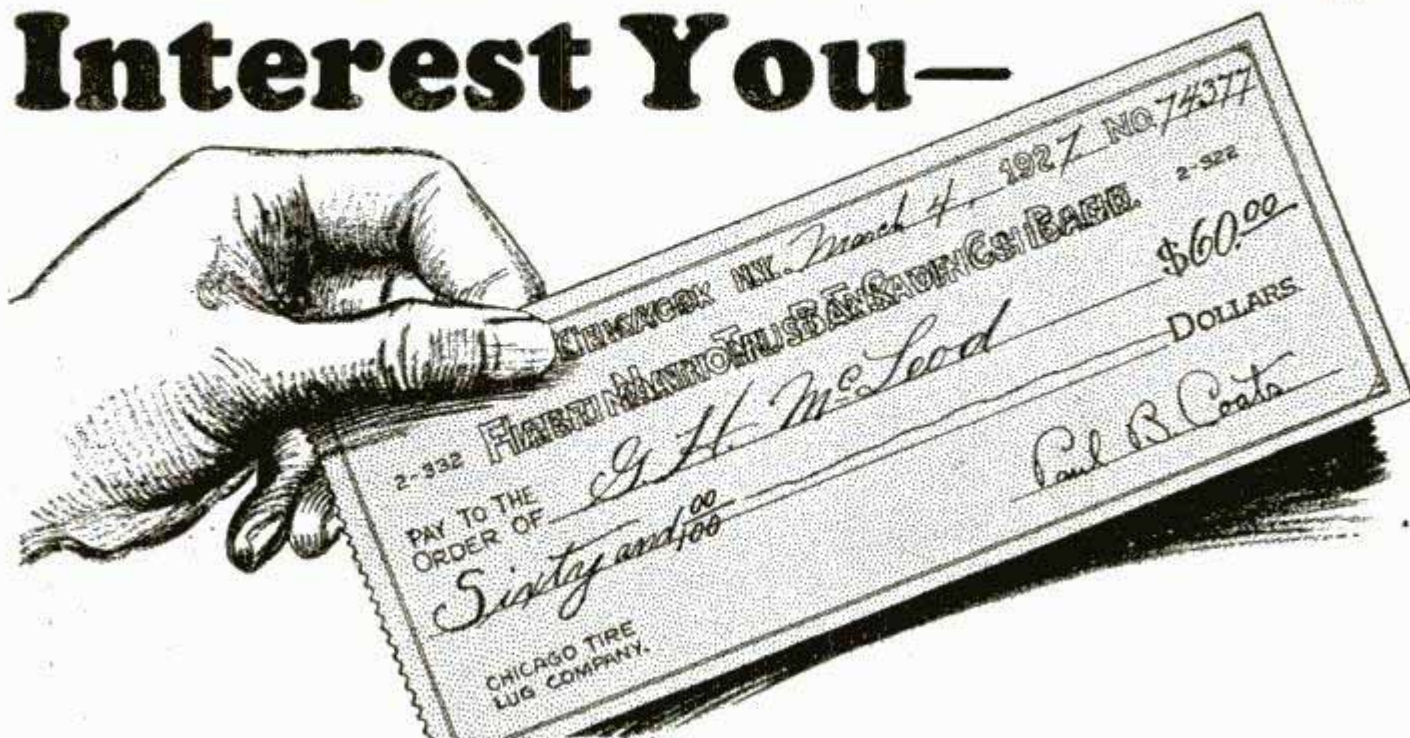
PLAPAO CO., 733 Stuart Bldg., St. Louis, Mo.

Name

Address

Return mail will bring Free Trial Plapao.

Would \$60⁰⁰ a Day Interest You—



The Amazing New Invention

That Is Sweeping Salesmen Into the Biggest, Easiest Profits of Their Lives—Your Golden Opportunity—G. H. McLeod Says \$60 a Day Is Easy With This Fastest of All Sellers.

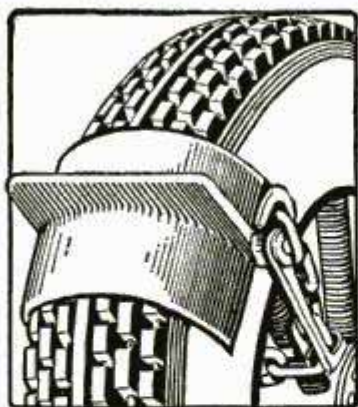
With this wonderful, new, simple invention, it is absolutely impossible to get stuck, even in the deepest mud, or sand. Ordinary tire chains aren't in it with this new, unfailing device.

Imagine driving a heavy seven-passenger sedan 28 miles over Missouri's black gumbo roads with the mud and water hub-deep all the way. Naturally, when autoists hear of a remarkable device like this, they don't rest in peace until they own a set for their own car.

A Gold Mine to Agents

Old and experienced direct sales agents say GETS-U-OUT is a gold mine for profits. GETS-U-

OUT TIRE LUGS sell like wild-fire everywhere, and on each and every sale, agents who act now, make \$2.50 or more profit. Think of the fortune right there in your community waiting for some live-wire ambitious fellow who wants to get into business for himself, and make a clean-up. Bigger profits and earnings than you ever dreamed of. This opportunity is yours — NOW. Why don't you take it?



**20,000,000
Live
Prospects**

Practically every car owner in the United States, Mexico, and Canada—over 20,000,000—is a good, live, prospect for a set of GETS-U-OUT TIRE LUGS, and you make \$2.50 and more on every sale. Think of the big cash profits waiting for someone right there in your locality. Honestly, never before has a product

with such universal appeal and big profits been offered through exclusive direct sales channels.

FREE Sample Offer

To fill in every unclaimed sales territory and further introduce this remarkable invention, Mr. Coats (the inventor) will send a complete sample set, at his own risk. Not only that, but he will lay before you the greatest wide-open offer sales plan known—five to twenty-five sales from one demonstration. Just send the coupon at once for full details of our special limited introductory sample offer. This is your opportunity to make big money and lots of it. Don't let the chance slip away from you. Mail the coupon right now!

Clip and Mail Coupon NOW!

OPPORTUNITY COUPON

Paul B. Coats,
Chicago Tire Lug Co., (Inc.),
852-336 W. 47th St., Chicago, Ill.

I want to get my share of the big money to be made with your new GETS-U-OUT PRESSED STEEL TIRE LUGS. Send me the facts without obligation about my profit and your territory plan.

Name.....

Address.....

City.....State.....

Chicago Tire Lug Co., (Inc.)

852-336 W. 47th Street, Chicago, Illinois

WATERWAYS ARE NEW HIGHWAYS OF HAPPINESS

Joyful Hours of Relaxation

*are Yours
when water-motoring
with a Johnson*



YOU who love the waters know the lure of wave-lapped shores—the joyful hours of relaxation that lie in peaceful pools—the thrill of spray-tossed bow and foaming wake—the joys of water-motoring.

This summer go water-motoring with a Johnson at the stern of your boat! Four Johnson Outboard Boat Motors for 1927 offer advancements in design and construction so outstanding that Johnson again sets a new standard of water-motoring

Johnson Outboard Motors

performance. Now, more than ever, is Johnson recognized as the leader in the outboard motor industry.

Ask your Johnson dealer to let you try one of the new Johnsons yourself. Four models offer speed ranges of 8, 13, 22 and 27 M. P. H. Ask him about the new Johnson Aquaplier—a 17-lb. outboard motor boat for four persons.

Johnson motors are sold on easy payments and can be insured against fire and theft at little cost. Write for full information.

JOHNSON MOTOR COMPANY, 2434 Sample Street, South Bend, Indiana

Export Division: 75 West Street
New York, New York, U. S. A.

Canadian Distributor: Peterborough Canoe Co.
Peterborough, Ontario, Canada

World's Largest Manufacturer of Outboard Boat Motors

Big Money Repairing Balloon Tires This Easy Way



Go into business for yourself. Become independent, well-to-do. Take advantage of tremendous revival in tire repair business. Millions of balloon tires in use now need repairs.

An easy way to make money. Small capital. No experience is needed. Plenty of jobs. Every motorist a prospect.

SHALER

Balloon Tire Vulcanizer

Lowest priced complete tire repair plant. Repairs fabrics, cord and balloon tires. Does just as good work as high priced machines. Anyone can operate it. Made by world's largest manufacturers of tire vulcanizers. Endorsed by leading tire makers and used by hundreds of repair shops. Guaranteed to do first class work.

FREE ON TIRE REPAIRING. Tells how to make big money and become established in business of your own. **WRITE QUICK!**

The SHALER Company, 2705 Fourth St., Waupun, Wis., U. S. A.
World's Headquarters for Tire Repair Equipment

"Interlox" The Speedy Rule for Accurate INSIDE Measurements

as well as outside—two rules in one. Quick acting—no folding. Strong, durable. Any length, 2 to 8 ft., 20c lineal ft. If not at dealers, sent postpaid.



MASTERS RULE MFG. CO., 813 E. 136th St., NEW YORK

Dealers and Agents: Write for attractive proposition.

Start to Play Very First Day

Be the life of the party. Xylorimbists make \$5 to \$25 a night. No knowledge of music required. Wonderful for home. Free, easy lessons; five days' trial; a year to pay. Write for big FREE Book.

J. C. DEAGAN, Inc.
1455 Deagan Building
CHICAGO



BUILD YOUR OWN GRANDFATHER'S CLOCK



We furnish blue prints, finishing material and instructions. Buy the works, dial, weights and pendulum from us at surprisingly low prices. You make a fine profit building artistic clocks for your friends.

Plain Works As Low As \$5.00. Others with Chimes At All Prices. Ask for Attractive Free Offer.

American Chime
Clock Company

1670 Ruffner St., Philadelphia



Three Food Experts Invent An Amazing New Business That Pays Men \$1,000 a Month!

A sensational new opportunity has suddenly flashed into the world's greatest industry! Now anyone can own a big food business and pocket steady profits of \$50 to \$250 a week! Co-operative plan starts you anywhere. Just mail coupon for the sensational details.

THREE Chicago food experts recently discovered a remarkable new kind of food! A crispy, flaky, fragrant, delicious new **greaseless** doughnut! Toothsome as pie or cake! As easily digested as bread! Yet cooked at the rate of 1 dozen every 3 minutes by an **inexpensive** electrical device that operates from any ordinary light socket!



\$1,000 A MONTH!

"My business was successful from the first day. I made over \$3,000 my first 3 months—more money than ever before in my whole life."—Thos. Minch, Fla.

Unlimited Possibilities

These experts knew that millions of old-style doughnuts are sold every day—hundreds of people are making fortunes in the doughnut business. And now—the "perfect doughnut!" Less expensive and far simpler to make! More delicious and "mouth watering" than old-style doughnuts ever were! No wonder these men were surprised, yes, literally astounded at the possibilities!

A Generous Co-operative Plan

In order to give every ambitious person a chance to start immediately in this big-money business, these experts have developed a unique co-operative plan. They furnish everything. No "red tape," no delay, no "ifs" or "buts." You get one of these wonderful electric doughnut machines, complete shop equipment, FREE advertising material, a big supply of prepared doughnut mix FREE, sure-fire sales plans, etc. Everything you need to make money like Minch who cleaned up \$3,000 his first three months—or Mrs. Jane Statz who started at home and in less than two months opened a big store with her profits—or many others who are literally coining money.

Act Quick for Details

The opportunity to own a big-money business through this sensational co-operative plan is now open practically everywhere. But it won't be open long. Territories are filling up fast. Send at once for details. Absolutely no obligation. Act fast. Mail the coupon today.

Food Display Machine Corp. Dept. 1355
350 W. Huron St. CHICAGO, ILL.

SPECIALTY SALESMEN!

Write, wire or 'phone for the greatest money making opportunity ever offered good specialty men. An entirely new and different kind of proposition with profit possibilities that will literally make your head swim! You must step fast. Territories are closing like hot cakes. So act today—this very minute is none too soon!

Food Display Machine Corp., Dept. 1355
350 W. Huron St., Chicago, Ill.

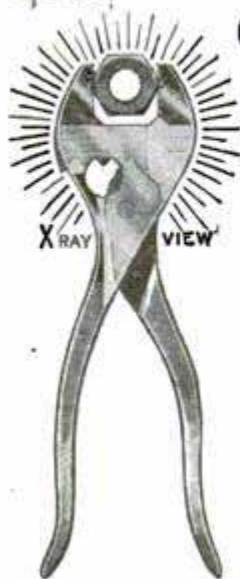
I would like to have you start me in a business where I can make \$60 to \$250 a week. Without obligation to me rush me details of your new Co-operative Plan.

Name.....

Address.....

Town.....State.....

AGENTS QUICK 40% COMMISSION SELLING GRIPNSTIK



Mechanics go wild about it. Out grips a plier and out sticks a wrench. The jaws are always parallel. The most powerful and most universal tool you ever saw. Made from the very finest steel and guaranteed through-out.

\$75 a Week Easy

Commissions paid at once. Costs you only \$2.65 for samples and all your supplies.

Write Today—Don't Delay

A thousand orders are waiting for you.

**The GRIPNSTIK CO.
DOVER, OHIO**

The GRIPNSTIK CO., Dover, Ohio

Gentlemen: I want to be your agent. Please send me sample GRIPNSTIK, holster clip, order blanks, and complete selling instructions, for which I enclose \$2.65 in full payment, postage included.

Name.....

Address.....City.....

County.....State.....

POWER! MILEAGE!

Amazing Vaporizer doubles gasoline mileage! Selling like wildfire! Guaranteed more mileage on ANY car! Official tests show 63% increase. Tested by world renowned automotive authorities! (Sworn proof) NO AIR VALVES! NO HOLES TO DRILL! Simple—efficient—easily installed. Thousands report astounding results! MAKE THE BIGGEST money of your life! 10 easy sales daily, your profit, \$1,000 a month! No experience needed—beginners can make \$100 to \$200 a week! FREE newspaper display advertising assures your success. A. B. Smith made \$800 in one day!

Write for wonderful proposition.

H. PHILIS MFG. CO., St. Louis, Mo.

FREE TRIAL OFFER ENDS BED SQUEAKS, WABBLES



No more creaky knots, falling slats, split posts. **Wittliff Braces** make beds rigid, silent. Fits all beds. Easy to attach. Invisible. Write for **Free trial offer**. Agents write for proposition.

**WITTLIFF FURNITURE BRACE CO.
120 Superior-Thirtieth Bldg.
Cleveland, Ohio**

Manufacturers of chair, bed and table braces



HB ONE DAY BATTERY CHARGING PAYS \$150 to \$300 MONTHLY PROFITS

Get in the moneymaking One Day Battery Charging business now. Big demand for One Day Charging Service for auto and radio batteries. Over 12000 shops now making big monthly profits with One Day Charging. Only \$35 cash puts money making HB One Day Charging outfit in your shop. Easy terms on balance—let your big monthly profits pay for outfit. No experience needed. Complete operating instructions free with each outfit. 30 days' free trial in your shop on moneyback guarantee. Ask for money saving prices on HB Automatic Air Compressors, Motors, Tire Buffers, Grinders, etc. Write for free bulletin 26.

HOBART BROS. CO.

Box M-571

TROY, OHIO

NOW ONLY \$35 PUTS THIS MONEY MAKING SERVICE IN YOUR SHOP



Be the Life of the Party

Fellows! Girls! and older folks, too! Don't take a back seat. Be the center of attraction. Play tunes at once. NO music to learn. NO weeks of tiresome practice. Play latest songs and hits by numbers instead of notes. Amazing new invention—you just press the keys and play!

Thousands Pleased

Joe Jung wrote: "Wonderful! Could not play before; now play in orchestra." Wm. Ausborn: "Now playing for dances." Anna Rahig: "Learned in 5 minutes." Mrs. A. Kassen: "Your ad didn't tell half." Ray Fox: "My friends wouldn't believe until they saw me play." John E. Green: "E-Z Player was pleasant surprise. I'm now a better musician than I ever expected to be." Julia Nagy: "Wouldn't sell my Uke for 3 times its cost." H. B. Jackson: "I must say it is a wonder."

No Play—No Pay

We guarantee you will play **Ferry E-Z Playing Ukulele, Banjo Uke, Tenor Banjo, GUITAR or MANDOLIN** or it costs you nothing. Know the full joys of music when you, yourself, play. Surprise your friends. If you already own an instrument you can attach an E-Z Player in a jiffy.

FREE BOOK

Thousands now play this new easy way. New friends—more fun—money-making opportunities when you play. Pay as you play. You'll be surprised how little the cost. Book tells all; it's free; no obligation. Send today.

**FERRY & CO., Dept. 9775,
CHICAGO, U. S. A.**



Lancing



Auto Party



Home Entertainment



Beach Fun



Men's Strap Watch direct from Switzerland

This fully guaranteed watch cannot be manufactured in America for less than \$12; shockproof jeweled movement—tells time in darkness. Silveroid engraved—cushion-shaped case, with genuine leather strap, engraved dial—accurate, durable. **\$3.99**
Send No Money. Pay on delivery \$3.99 plus postage. "Federal" U. S. Swiss Agents. 561 Broadway, New York City, Dept. W9



BRAND NEW IDEA GRAB THIS QUICK

Make \$300.00 Every Week

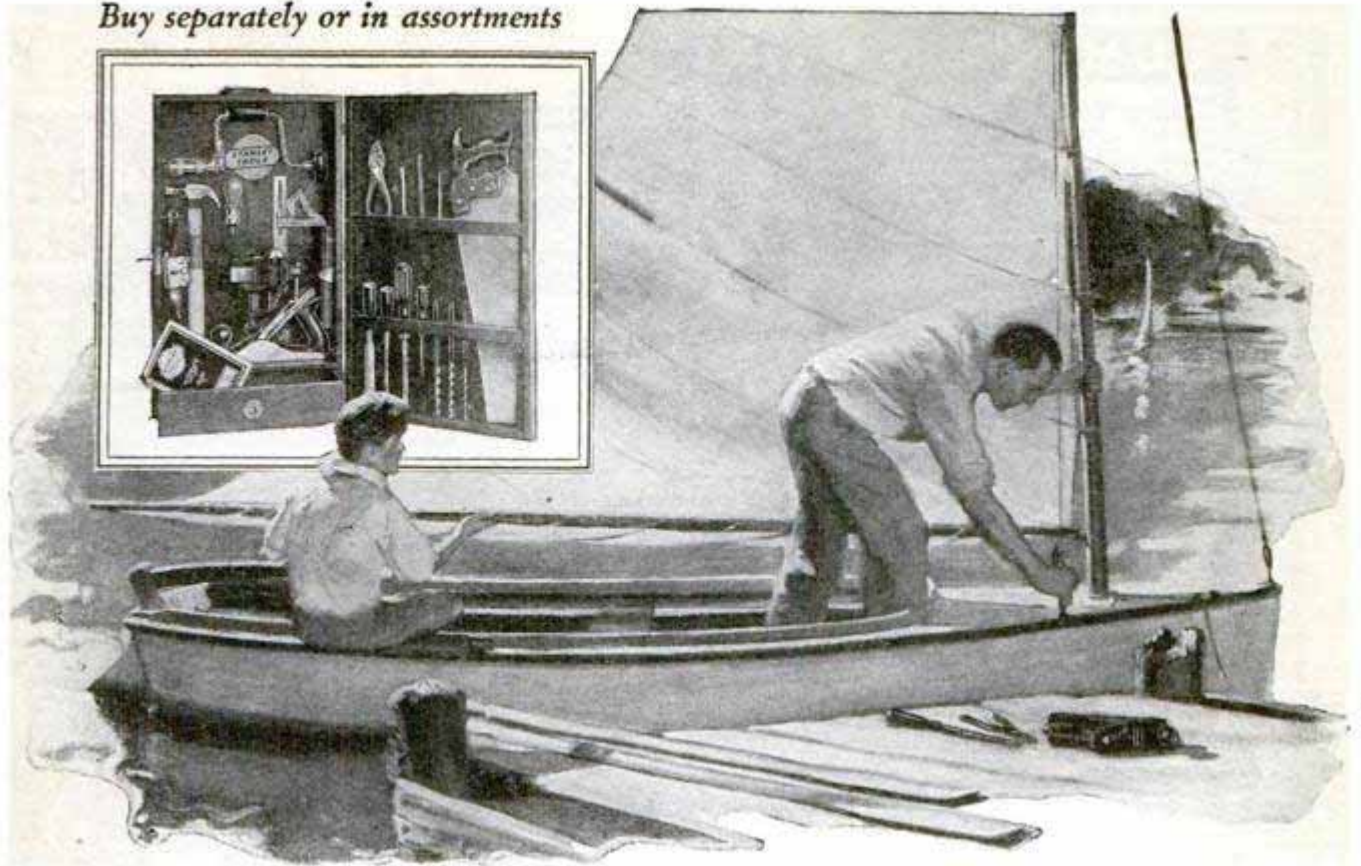
No experiment. Test shows idea works. Drug and department stores. They put on your sale on 25% basis. We tell you how to do it and furnish advertising copy (for your local paper) containing coupon offering beautiful bottle Narcissus Perfume at 39c, regular \$1.00 seller. Every bottle has flashy label and comes in attractive box. Costs you only \$13.50 per gross. Takes in over \$56.00. Face Powder, regular 75c seller, \$15.00 per gross. Five full size assorted samples of each will be sent \$1.00 postpaid. Get started today while the idea is new. Write now. Our catalog showing many other items, all at bargain prices, is yours for the asking. **National Soap & Perfume Co., 512 W. Huron St., Dept. B-7, Chicago, Ill.**



STOP LOSING YOUR COMB
JUST OUT NEVER LOSE COMBS
CAN BE FASTENED ANYWHERE ON DRESS COAT VEST OR SHIRT
Agents: 12 combs, assorted colors, on display stand. Wonderful sellers to dealers or direct. Price 30c. Send 10c for sample and wholesale prices. **N. L. COMB MFG. CO.** LeSueur Center, Minn.



Buy separately or in assortments



Here's an all-around boat

YOU sail when you want to. You row when you want to. To buy such a boat might cost a hundred dollars or more. But with Stanley Plan No. 19-D, you can make a combination boat like that in the above picture at little expense. The plan also shows how to order lumber and other materials.



Of course you realize that good tools are essential to good craftsmanship. Most carpenters prefer Stanley Tools. Stanley Tools are also the first choice of thousands of manual training instructors. The Stanley trade-mark assures durability, correct design, and right "feel."

You can buy Stanley Tools separately and so collect your own set. For your convenience

in buying there are also complete sets of Stanley Tools in chests at a wide variety of prices from \$15 to \$95. Or there are assortments in strong cardboard boxes containing directions for making your own tool chest. Priced from \$5 to \$20.



Your hardware dealer has Plan No. 19-D as well as other Stanley Plans for making useful articles, or he can get them for you. The plans cost only 10c each. Ask him also for Catalog No. 34-D, which shows the most complete line of woodworking tools on the market. It is free. If he cannot supply you write to The Stanley Works, New Britain, Conn.

The best tools are the cheapest to use
Ask your hardware dealer



STANLEY TOOLS



LUMINOUS PAINT

Make Your Watches, Clocks, Etc., Visible by Night

The very latest discovery in the scientific world. Hitherto, practically unobtainable except at an exorbitant price, we have at last succeeded in producing this remarkable LUMINOUS PAINT, which, applied to the surface of any article, emits rays of white light, rendering it perfectly visible in the dark. THE DARKER THE NIGHT, THE MORE BRILLIANT IT SHINES. Quite simple to use. Anyone—you can do it. A little applied to the dial of your watch or clock will enable you to tell the time by night. You can coat the push buttons or switch plates of your electric lights, match boxes, and innumerable other articles; make your own Luminous Crucifixes, Luminous Rosaries, etc. Small bottle, price 25c. Larger sizes, 50c and \$1 postpaid. **JOHNSON SMITH & CO., Dept. 809 RACINE, WIS.**

Serpent's Eggs Exploding Cigarettes

Box contains 12 eggs. When lit with a match, each one gradually hatches itself into a snake several feet long, which curls and twists about in a most life-like manner. Price per box, 10c postpaid, 3 for 25c.

CIGARETTE MAKER



Roll your own and save money. Makes them better and quicker besides saving more than half. Use your favorite brand of tobacco. Neat, useful and handy. Pocket size, weighs 15 oz. Made entirely of metal, nickel-plated. Price 25c postpaid.

MIDGET BIBLE

GREAT CURIOSITY
Smallest Bible in the World. Size of a postage stamp. 200 Pages.



Said to bring good luck to the owner. A genuine work of art. Must be seen to be appreciated. Make good money selling them to friends, church acquaintances, etc. PRICE 15c each. 3 for 40c, 12 for \$1.35, 100 for \$7.50. Also obtainable in Leather Binding, with gold edges. Price 50c each, 3 for \$1.25, \$4.50 per doz. Magnifying Glass for use with Midget Bible, 15c.

STAGE MONEY



With a bunch of these bills, it is easy for each person of limited means to appear prosperous by flashing a roll of these bills at the proper time and peeling off a genuine bill or two from the outside of the roll, the effect created will be found to be all that can be desired. Prices, postpaid: 40 Bills 20c, 120 for 50c, or \$3.50 thousand postpaid.

Wonderful X-Ray Tube



A wonderful little instrument producing optical illusions both surprising and startling. With it you can see what is apparently the bones of your fingers, the lead in a lead pencil, the interior opening in a pipe stem, and many other similar illusions. A mystery that no one has been able to satisfactorily explain. Price 10c, 3 for 25c 1 dozen 75c. Johnson Smith & Co.



Good Luck Ring
Quaint and Novel Design

A VERY striking and uncommon ring. Silver finish, skull and crossbones design, with two brilliant, flashing gems sparkling out of the eyes. Said by many to bring Good Luck to the wearer, hence its name. Good Luck Ring. Very unique ring that you will take a pride in wearing. **ONLY 25 CENTS.**

JOHNSON SMITH & CO.

Dept. 809

RACINE, WIS.

A De Luxe Edition of our new 1927 CATALOG mailed on receipt of 25c. Handsome binding. Bigger and better than ever. Only book of its kind in existence. 550 pages of all the latest tricks in magic, the newest novelties, puzzles, games, sporting goods, rubber stamps, unusual and interesting books, curiosities in seeds and plants, etc., unobtainable elsewhere. Remit by Stamps, Coin, Money Order, Check, etc. Unused U.S., Canadian and Foreign Stamps also accepted.

Blank Cartridge Pistol

REVOLVER STYLE

PRICES

50c &
\$1.00

Post-Paid



Well made and effective Pistol modeled on the pattern of the latest type of Revolver; appearance alone is enough to scare a burglar. When loaded it may prove just as effective as a real revolver without danger to life. Takes standard .22 Calibre Blank Cartridges obtainable everywhere. Even the most timid person can use it with perfect safety. A Great Protection Against Burglars, Tramps and Dogs. You can have it lying about without the danger attached to other revolvers. **PRICE ONLY 50c**
Better make and superior quality for \$1.00, Postpaid.
Blank Cartridges .22 Calibre, (by express) 50c per 100.
Revolver Holster and Strap (Cowboy type) for Blank Cartridge Pistol, 50 cents extra.

BOYS! BOYS! BOYS! THROW YOUR VOICE



Into a trunk, under the bed or anywhere. Lots of fun fooling the teacher, policeman or friends.



THE VENTRILO

a little instrument, fits in the mouth out of sight, used with above for Bird Calls, etc. Anyone can use it.

Never Fails. A 16 page course on ventriloquism, the Ventrillo, ALL FOR 10 CENTS



Everything about the Ku Klux Klan told in a clear, fearless manner. Book tells all—How it started and was oppressed in 1871—The New Ku Klux Klan—How Organized—How Members are Enrolled—Oath of the Klan—Questions for Candidates—Creed—Objects of the Order—Obedience—Fidelity—Pledge of Loyalty—Ku Klux Klan and the Masons—The Jews—The Masons—Real K. of C. Oath—The Negro Ku Klux Klan, etc., etc. Latest and most complete book on the Klan published. Price 25c, Postpaid. Stamp or Coin.



Female SEX Indicator 25c Male Sex Indicator



Hold the MAGIC INDICATOR over a man's hand—Instantly it moves in a straight line, backward and forward. Hold it over a woman's hand and it describes a complete and continuous circle. The same action can be obtained over a letter written by a man or woman, etc. It is fascinating; baffling. We have never been able to figure out how it's done, but we've never seen it fail. Many novel and entertaining feats may be performed with the Sex Indicator. For example, similar results can be obtained with animals, cats, dogs, rabbits, over birds, chickens, canaries, etc. Also used to predetermine the sex of chickens and birds, etc. In fact it is sold as a patented sex tester in Europe. Price 25c, or 3 for 65c, p.p.d.



LOOK 35c Look
Wonderful instrument. Greatest thing yet. Nine separate articles in one. Everybody delighted with it. Odd, curious and interesting. Lots of pleasure as well as very useful. It is a double Microscope for examining the wonders of nature. It is also an Opera Glass, a Stereoscope, a Burning Lens, a Reading Glass, a Telescope, a Compass, a Pocket Mirror, and a Laryngoscope—for examining eye, ear, nose and throat. It is worth all the cost to locate anyone painful cinder in the eye. Folds flat and fits the pocket. Something great—you need one. Don't miss it. Sent by mail, postpaid. Price only 35c or 3 for \$1.00

JOHNSON SMITH & CO., Dept. 809, RACINE, WIS.

COMIC CELLULOID BUTTONS



These Comic Celluloid Buttons provide subjects for pleasant jokes and amusing conversation and thus smooth the way to a more familiar acquaintance and cordial friendship. There are seventy different titles altogether, all very wittily worded and quite unobjectionable. Wear one and see the effect. All four Buttons illustrated above will be sent postpaid to any address for **ONLY 20c** or a dozen, all different, for **48c**.

SURPRISE SOAP



You've heard of people turning green with envy but they haven't turned half as green as the fellow who unwittingly uses this soap. It is an exact duplicate of an ordinary piece of soap. Secret: it contains a chemical which acts like a dye as soon as it comes into contact with water. **PRICE 15c postpaid.**

KEYLESS LOCKS

These clever locks cannot be opened unless you know the combination. No key necessary. For your locker, bicycle, tool chest, mail box, thousands of uses. Shackle and tumblers nickel plated. Weighs trifles over one ounce. Small, yet strong. Secret and full instructions with each lock. **PRICE 25c** or 3 for **65c** postpaid.



25c

Postpaid

Every Boy His Own Toy Maker



Greatest boys' book written. Tells how to make a Pinhole Camera, a Canoe, model Railroad, a Telephone, Boomerang, Telegraph Instrument, Box Kite, Talking Machine, Microscope, Electric Motor, Electric Door Bell, Water Wheel, Paddle Raft, a pair of Skis, a Dog Sled, Bird House, Rabbit Yard, etc. 64 pages, 150 illustrations. **PRICE 10c** postpaid; 3 for **25c** postpaid.

INVISIBLE INK

The most confidential messages can be written with this Ink, for the writing **Makes No Mark.** Cannot be seen unless you know the secret. Invaluable for many reasons. Keep your postals and other private memorandums away from prying eyes. Great fun for playing practical jokes. **Only 15c a Bottle; 3 for 40c.**



REAL PISTOL

Shoots Blank Cartridges



Pull the trigger and it goes off with a loud bang. Pistol is break-open type; illustration shows position for loading. Made entirely of high grade steel, nickel plated, ornate barrel, handsomely engraved handles, complete in box with cleaning rod. **PRICE \$1.75.** Also furnished with pearl handles, **\$2.50.** **BLANK CARTRIDGES, 50c** per box of 25. **JOHNSON SMITH & CO., Dept. 809, Racine, Wis.**

Miniature Watch Charm Pistol

Exact reproduction of a real pistol; actually fires **REAL BLANK CARTRIDGES** of miniature size. Illustration is actual size. **1 1/4** inches long, with ring at end for attaching to watch chain. Loads like a regular pistol.

RESURRECTION PLANT



One of the most wonderful plants known. Possesses the strange power of turning in a few minutes from an apparently lifeless, dry herb to a **BEAUTIFUL LIVING FERNLIKE PLANT** of a dark green color. Simply place the plant in saucer of water, it will open up and start to grow in 20 minutes. When taken out it will dry up and go to sleep until placed in water again. Fine house plant—summer or winter. **10 cents each** or 3 for **25c.**, **75c** per doz., postpaid.

Microphone Transmitter Button



\$1.00
POST-PAID

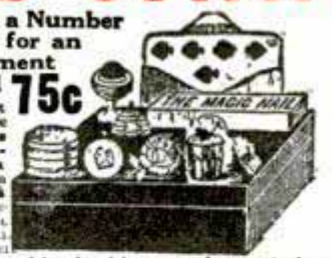


You can easily make a highly sensitive detectophone by using this Transmitter Button to collect the sound waves. You can build your own outfit without buying expensive equipment. It is simple and inexpensive. You can install an outfit in your home and hear conversations being held all over the house. You can connect up different rooms of a hotel. This outfit was used by secret service operatives during the war. It is being used on the stage. It is ultra-sensitive and is the greatest invention in micro-phones. You can mount the button almost anywhere—card board boxes, stove pipes, stiff calendars, on the wall behind a picture frame, etc. Button is so light and small it cannot be detected. Persons can be overheard without suspecting it. You can listen in on conversations in another room. A deaf person in the audience can hear the speaker. Connected to phonograph, piano or other musical instrument, music can be heard hundreds of feet away. Button may be used to renew telephone transmitters; often makes an old line "talk-up" when nothing else will. The ideal microphone for radio use; carries heavy current and is extremely sensitive. Amplifies radio signals. Countless other similar uses will suggest themselves. Experimenters find the button useful for hundreds of experiments along the lines of telephones, amplifiers, loud speakers, etc. Many fascinating stunts may be devised, such as holding the button against the throat or chest to reproduce speech without sound waves. \$5.00 is given to anyone who sends in a new suggestion for the use of the Button providing the manufacturers find it suitable for use in their literature. **PRICE \$1.00 POSTPAID ANYWHERE.**

Send remittance (Postage Stamps accepted) for all articles listed on above and previous page to

MAGICIAN'S OUTFIT

Apparatus and Directions for a Number of Mysterious Tricks Enough for an Entire Evening's Entertainment
ANYONE CAN DO THEM 75c



It is great fun mystifying your friends. Get this Conjuror's Cabinet, and you will be the cleverest fellow in your district. It contains the apparatus for seven first-rate tricks, including The Disappearing Rose, that, when placed on the lapel of your coat, vanishes from sight at will; the Magic Vase and Ball Trick (a Wooden Ball is placed inside, and upon replacing the lid has disappeared and is found in someone else's pocket); The Magic Box with which you can apparently cut your finger almost in two; the Wonderful Card Trick (a card is placed in an envelope, and when open an entirely different card altogether is found); The Disappearing Coin Box (a coin is placed in the little wooden barrel, and when opened again, is found to have vanished entirely, or can be made to change into a coin of another denomination); The Famous Dissolving Penny Trick; The Glass Goblet and Vanishing Coin Trick (a coin is dropped into a glass of water, and when the water is poured out the coin has vanished). With the tricks described above we send full printed instructions for performing each trick, so that anyone can readily perform all the tricks to the great amusement of their friends or the public. Any boy of ordinary intelligence, with this Cabinet of Tricks in his possession, can give a parlor entertainment not inferior to some regular magicians. Besides the tricks contained in the Cabinet, there are many other feats and illusions fully explained with full printed instructions, for which you easily make or procure the necessary apparatus. This unexcelled Cabinet of Tricks for **ONLY 75 CENTS POSTPAID TO ANY ADDRESS.**

Great Fire Eater

Most Sensational Trick of the Day!



With the Fire Eater in his possession any person can become a perfect salamander, apparently breathing fire and ejecting thousands of brilliant sparks from his mouth, to the horror and consternation of all beholders. Harmless fun for all times, seasons and places. If you wish to produce a decided sensation in your neighborhood don't fail to procure one. We send the Fire Eater with all the materials, in a handsome box, the cover of which is highly ornamented with illustrations in various colors. **Price of all complete outfit only 30 cents, postpaid.**

SQUIRT ROSE

25c



A REAL STARTLER. This is the most popular of all squirt tricks. The flower in your coat looks so fresh and sweet that everyone is tempted to inhale the delightful perfume. Then is the moment to press the bulb. Guess! Guess! Don't they jump? There is a very long rubber tube that easily reaches to the pocket of your coat or trousers, and the bulb is large enough to make a dozen shots with one loading. **PRICE 25c** each, or 3 for **65c** postpaid.

PISTOL, OPERA & FIELD GLASS

PRICE POSTPAID. \$1.00



It is made in the shape of and looks like a regular Automatic Pistol. No one is likely to stop and ask you whether it is real or not.

Thus it is likely to prove itself very handy in an emergency. On pressing the trigger it opens up, as shown in the illustration at the right, revealing nine useful articles: Opera and Field Glass, Telescope, Mirror, Magnifying Glass and Burning Lens, Reading Glass, Sun Dial, Sun Compass, etc. In the handle of the revolver there is a place for various pocket necessities, such as First Aid Articles, Buttons, Pins, etc. The Pistol is of sheet metal, blued finish, that can be carried comfortably in pocket. **PRICE \$1.00.**

SURPRISE MATCHES

More fun than fighting with your wife. Look just like ordinary matches. Put up in boxes just like regular Safety Matches. As the victim tries to light one he gets quite a surprise. **PRICE 10c** per box, 3 boxes for **25c**, or 12 for **75c**.



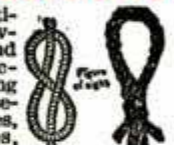
SEEBACKROSCOPE

By merely placing this clever instrument to your eye, you can see what is going on behind your back, and sometimes things when no one thinks you are looking. Why it is just like having eyes at the back of your head. **PRICE ONLY 25c**, postpaid, 3 for **50c**.



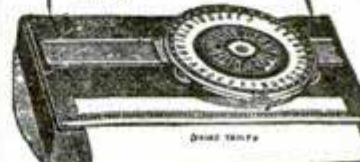
NEW BOOK ON ROPE SPLICING

A most practical handbook giving complete and simple directions for making all the most useful knots, hitches, rigging, splices, etc. Over 100 illustrations. All about wire rope attachments, lashing, blocks, tackles, etc. 37 Heraldic Knots illustrated. Of great value to mechanics, riggers, campers, boatmen. **Price 20 cents postpaid.**



The "Little Giant" Typewriter

A First Class Writing Machine For \$1.50



A perfect little typewriter for \$1.50. There are thousands of persons who would like to use a typewriter but whose needs and business do not warrant the expense attached to the purchase and use of a fifty or seventy-five dollar machine. To such persons we confidently recommend our Little Giant. It is strongly made, but simple in construction, so that anyone can quickly learn to operate it, and write as rapidly as they would with pen and ink. The letters of the alphabet 1 to 10, and the punctuation marks being together. With this machine you can send your best girl typewritten love letters, address envelopes, make out bills, and do almost any kind of work not requiring a large, expensive machine. With each typewriter we send a tube of ink and full printed instructions for using the machine. **Price complete \$1.50** by mail postpaid to any address in the world.

JOHNSON SMITH & CO. Dept. 809 Racine, Wis.

Ask the Man Who Mows One

The tougher the beard, the easier it is to shave with Barbasol. . . No brush. No rub-in. No after-smart. Try Barbasol—3 times—according to directions. "Mister, you're next!"



Barbasol

For Modern Shaving

The Barbasol Company
Indianapolis, Ind.

I enclose 10c. Please send trial tube.

Name.....

Address.....

P-M-5-27

NEW VEST POCKET ADDING MACHINE



ADDS, SUBTRACTS, MULTIPLIES, DIVIDES
Does work of \$300 machine. Guaranteed 5 years.
NOT A TOY.
Made of steel and indestructible. Million dollar capacity. Fits in pocket. Will not make mistakes. So simple child can operate it. Instructions furnished. Everybody should carry one for figuring.

FREE TRIAL \$2.50
Total Cost

SEND NO MONEY—Just name and address. We will ship Calculator immediately. On delivery pay postman \$2.50 (Plus few cents Postage). (If outside U. S. send cash). If not satisfied after 10 day trial you get your money back. **THOUSANDS OF SATISFIED USERS.** This is lowest priced practical calculator made. "Why pay more for inferior imitations?" Order from this ad.

--- Mail Coupon Today ---

BABY CALCULATOR SALES COMPANY
Dept. 41, P. O. Box 1118, CHICAGO, ILL., U. S. A.

- ☐ I am enclosing \$2.50—send adding machine prepaid.
☐ Send Adding Machine C. O. D. \$2.50 plus postage.

Name.....

Address.....

City.....

State.....

AGENTS

Write for big commission and territory proposition.

FREE

New 1927

Radio Catalog

BEFORE you build or buy a radio be sure to consult our new 100 page catalog—sent to you free. All the latest kits, accessories and parts—a million dollar radio stock to choose from.

We Save You Money

We handle only brand new apparatus—standard makes that are fully guaranteed. **QUANTITY** sale of **QUALITY** parts explains our low prices. Compare with others and see why thousands of fans look to us as radio headquarters. Write for your copy of this new catalog today.

Chicago Salvage Stock Store

Dept. PM 509 S. State Street, CHICAGO, U. S. A.

For Better Filament Control on your radio set use the **NEW Lynch EQUALIZOR** in place of rheostats. \$1 complete with mounting. At your dealer's or post-paid. Money back if dissatisfied. In ordering, state number and types of tubes in your receiver. **ARTHUR H. LYNCH, Inc., Manufacturers of the Lynch Metallized Resistor, 250 West 57th Street, NEW YORK, N. Y.**

SOLDERALL

METAL IN PASTE FORM



Every Electrical Connection needs Solderall for perfect reception. **25¢**
The SOLDERALL CO., NEWARK, N.J.

A & B Battery \$2 Charger ONLY

SATISFACTION GUARANTEED

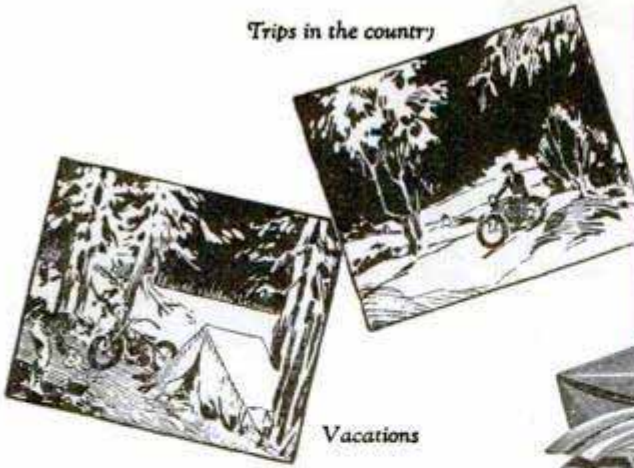


Charges any type of storage A or B battery, using a few cents worth of ordinary house current, either alternating or direct. Cannot injure battery. Complete directions enclosed. Anyone can operate. No expensive "extras" to buy. Why pay \$10.00 to \$15.00 for a charger when you can get this splendid **GUARANTEED R. B. Charger** by mailing us two dollars (bills, money order, check or stamps) plus ten cents in stamps or coin to pay mailing costs. Charger will be sent postpaid. If you are not satisfied, return within five days and we will refund your money. Order at once—**TODAY.**

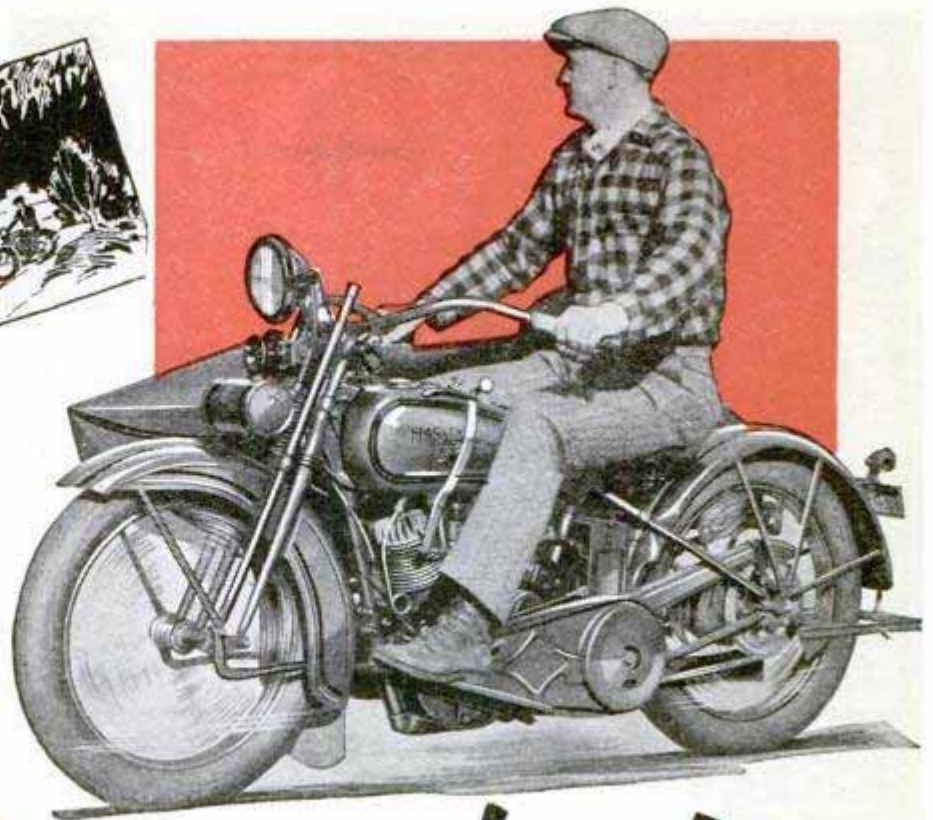
R. B. SPECIALTY CO.

Dept. K-2 308 East Third St., Cincinnati, O.

Trips in the country



Vacations



for Sport, Health, Economy!

Vacation trips, the very ones you've promised to take "some day" — glorious week-end tours over back-country routes — you can afford them all with a Harley-Davidson Twin!

Happy, carefree miles over winding rural roads, with the fresh country breeze in your face — that's motorcycling, the sport of a thousand joys!

Plenty of room in the sidecar for a friend and your outfit. Upkeep is only a fraction the cost of a car — 2¢ per mile for gas, oil, tires and all. You can buy a Twin as low as \$310 f. o. b. factory — on easy Pay-As-You-Ride terms.

See your dealer — send coupon for catalog.

HARLEY-DAVIDSON MOTOR COMPANY
Department P Milwaukee, Wisconsin

Running
errands

To work and back

HARLEY-DAVIDSON

Motorcycles

The Harley-Davidson line includes Single and Twin-cylinder models in a wide range of prices. Get our catalog.

Mail
This!

HARLEY-DAVIDSON MOTOR COMPANY
Department P, Milwaukee, Wis.

- ☐ Interested in Twin.
☐ Interested in Single.

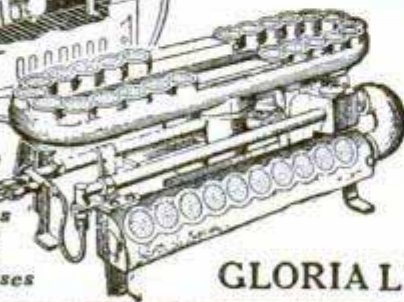
Name

Address

OXO-GAS

OIL BURNERS

OXO
GAS oil
burner
for ranges
One of 20
types for
all purposes

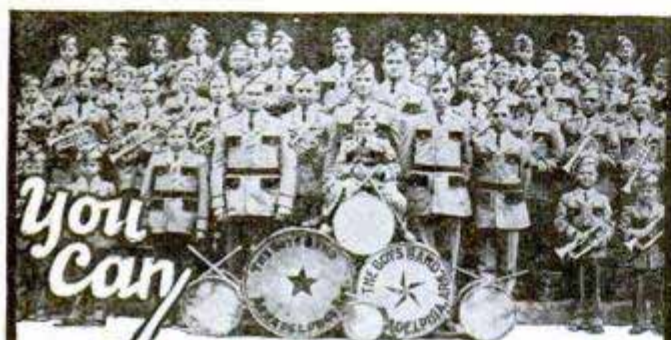


For Furnaces, Ranges, Heating Stoves, Etc.

OXO-GAS, the cheapest, cleanest, most efficient fuel known to science, is made from kerosene or distillate, and air, mostly air. Burns with a pure blue flame of high heating intensity, as silently as city gas. Over a million in use. Manufactured by the oldest (est. 1906), highest rated and most responsible corporation. Ask any bank. Send for Catalog illustrating and describing twenty different distinctive designs of oil burners for Furnaces, Cook Stoves, Heating Stoves, Base Burners, Hot Water Heaters, etc.

Agents Wanted Some choice territory for OXO-GAS agencies still open to thoroughly responsible parties. Your own locality may yet be unassigned.

GLORIA LIGHT COMPANY, 111-5 N. May St., Chicago, Ill.



You Can Play ANY Instrument in a Band

We'll Help YOU Buy a Pan-American

JOIN your local band or orchestra and play a Saxophone, Clarinet, Trumpet, Sousaphone, Flute or other wind instrument. You can Now. The PAN-AMERICAN Easy Payment Free Trial Plan makes it possible. PAN-AMERICAN band and orchestra instruments are the greatest value on the market for the money, recommended by America's foremost band and orchestra leaders. Tested and found superior by leading artists. Send coupon below for our reasonable low-price offer and Easy Payment Plan on any PAN-AMERICAN instrument you desire.

SEND NO MONEY :- MAIL COUPON

The PAN-AMERICAN Band Instrument & Case Company
Elkhart, Indiana Dept. G-8

YES. Send me complete information on your Easy Payment Plan for purchasing PAN-AMERICAN Band Instruments. I am interested in (instrument).

Name

Address

My local Music Dealer is

12,000,000 FORD OWNERS

Need This NEW Timer!



Automotive engineers claim that the average Ford may wear out from 8 to 10 ordinary Timers. Think of the sales possibilities when you offer the "Dynamo Timer" with a guarantee for the life of the car. You do not have to be a salesman. This amazing Timer sells itself on sight. You make 200 per cent profit on every sale.

Makes Old Fords Run Like New

Once a Ford is equipped with the "Dynamo" the timer can be forgotten—the only thing that will prevent forgetting it will be the noticeable improvement in the running of the car. More power, more mileage, instant starting, amazing pickup, are a few of the features that will make any Ford owner a "Dynamo" booster after he once uses this new Timer.

Get Territory Quick

Our agents can easily make \$5,000, \$6,000, yes, even \$10,000 a year. Sparetime workers make \$20.00 and even \$30.00 a day.

John Cable made \$200 in less than 10 days. Many others report tremendous profits. You too can get into the big money class the same as John Cable and others.

DYNAMO TIMER CO.
426-884 Eleventh St., Milwaukee, Wis.

FREE SAMPLE

To aid our agents we have arranged a plan that provides them with a Free Sample so they can equip their own car or carry it for demonstration purposes. The unique principles of this wonderful Timer will make themselves apparent to any Ford owner after a minute's examination. Send name and address for Free Sample Offer and particulars of our big money making proposition.

CAL. 30-40

KRAG CARBINE STYLE

The Choice of those who know. 5 shot, 22 inch Barrel. A few used, but service-able, for \$9.75. Shipping weight, 13 lbs. Shipping extra. \$15

Krag Rifle \$12.50 Krag Sporting Rifles \$14.00
Springfield 45 Shot Guns 4.75 SPRGFLD. 45 Carbines 4.50

Krag Bayonets 40 cents each. Postage Extra—Shipping Weight 2 1/2 lbs.
Terms Strictly Cash. No C. O. D. Shipments.

Catalogue Free on Request.
W. STOKES KIRK, 1627-P. M., North 10th St., Phila., Pa.

PORTABLE AND FOLDING BATH TUB



Supplies all bathing comforts of millionaire in any room. Only practical outfit for homes without plumbing. Ready for instant use. No plumbing required. Twelve gallon nicked hot water tank. Puritan blue flame burner. Heats water quickly. Ball bearing castors. Guaranteed satisfactory. Moderate price.



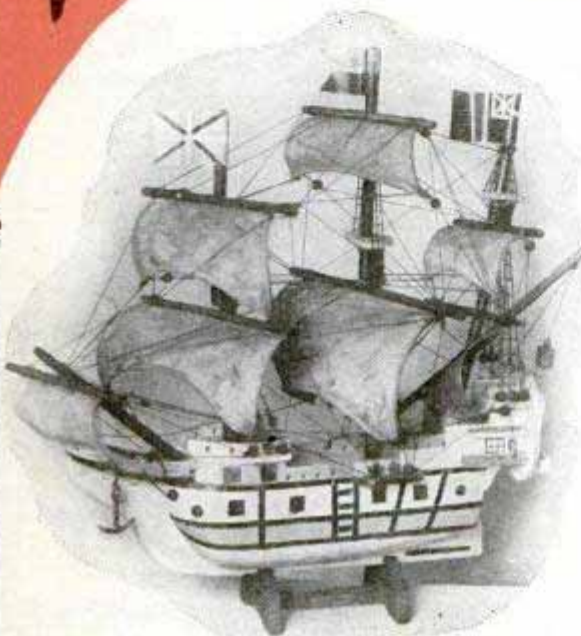
World's largest manufacturer of portable bath tubs; 24 years in business. Responsible dealers wanted. Write today for trial offer, illustrated literature and territory.

ROBERTS SALES & ENGINEERING CO.
Dept. 52 740 Meldrum Detroit, Mich.
Also Manufacturers of the Famous Roberts Oil Burner.



WINS FIRST PRIZE

COST
\$4.98



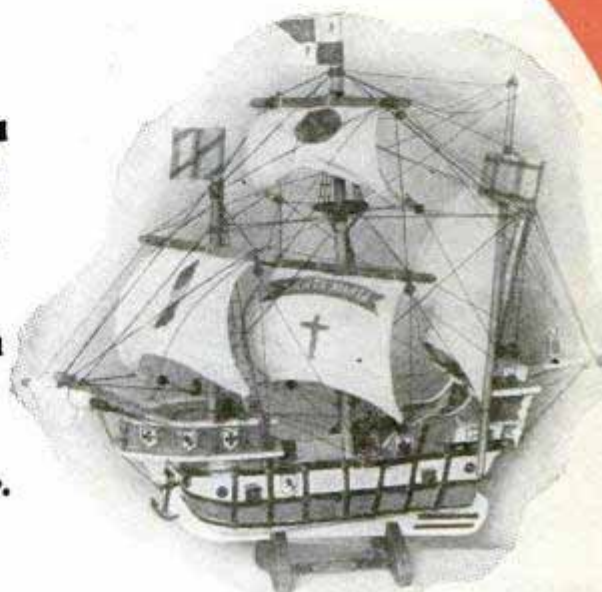
MAYFLOWER

The Ship that brought the Pilgrims to America.

Size: Height 25 inches, Width 9 inches, Length 27 inches.

No tool needed but a small tack hammer.

Any school boy can put together.



SANTA MARIA

The Flag Ship of Columbus in the Discovery of America in 1492.

Size: Height 25 inches, Width 11 inches, Length 27 inches.

You Can Put These Models Together in a Few Hours

We have received so many letters of inquiry from all over the country asking us how they can get a beautiful Ship Model without paying \$100.00 or more. Realizing that the high prices asked have made it possible for only a very few to have one of these beautiful models, the WORLD'S LARGEST BUILDERS OF SHIP MODELS have decided to try out a plan that will make it possible for everyone to own one of these beautiful models, by supplying you with all the parts, cut to fit, and ready to put together. You need know nothing about ship building. We have made it so simple and easy by explaining every operation so clearly that a school boy can put one of our models together in a few hours. No confusing details; diagram and instruction sheets are written so that anyone can understand them.

Mrs. C. J. Bierbower of Philadelphia, Pa., after completing a Model of the "Santa Maria" from our \$4.98 cut to fit parts, was so pleased and delighted with the Model, that she entered it in a Model Contest held by the Publishers of Science and Invention Magazine. This Model was entered against hundreds of other Models from all parts of the country, and Mrs. Bierbower's Santa Maria was awarded the Grand Prize Worth More Than \$100.00 for its Decorative Beauty and Simplicity of Construction. While Mrs. Bierbower was delighted, she said, "that it was not a surprise as the Model was the most beautiful of its kind that she had ever seen." The parts we will send you are identical with the Ones Used by Mrs. Bierbower. There Were No Parts Used In This Prize Winning Model Other Than Those Supplied By Us In Our Regular \$4.98 Complete Kits.

We supply you with every part to build either the Santa Maria or the Mayflower Models, with a full detailed diagram and instruction sheets showing and explaining every operation to complete these beautiful models. Hull and all parts are of wood. This is not a cheap cardboard imitation.

List of parts supplied for "Santa Maria." Space does not permit describing the parts for "Mayflower," but it is just

as complete in every detail. Hull and keel, 3 pieces; rudder, rudder support; 6 hause pipe rings; 6 cannons; 6 port shutters; 11 shields; front and poop deck sides; railings; upper deck with decorated stern; rigging channels; anchor; lamp and bracket; crow's nest; bowsprit; yard arm; 3 masts, fore, main and mizzen; spanker boom; jib yard arm; fore mast yard arm; main sail yard arm; top sail yard arm and lateen sail yard arm; wire for sails; brass name plate; rigging cord (light and heavy); brads; staples; glue; pulleys or blocks and falls; rear balcony; rear balcony railings; side balconies; side cabins; flags; ladders; 18 bumping strips; jib sail; fore sail; top sail and mizzen sail; stand, 3 pieces; all parts needed to complete the Model. Shipping weight, 6 pounds. All Canadian or Foreign orders must be accompanied by Money Order for \$4.98, plus a sufficient amount for parcel post charges.

Write for our free, beautiful illustrated booklet on Ship Models and their History.

**MINIATURE SHIP MODELS, Dept. 10,
3818-20-22-24 Baring St., Philadelphia, Penna.**

Please send me the completed parts, cut to fit, and ready to assemble for the Model.....
I will pay postman \$4.98 plus postage (a few cents).

PLEASE PRINT NAME AND ADDRESS PLAINLY TO AVOID DELAY.

Name.....

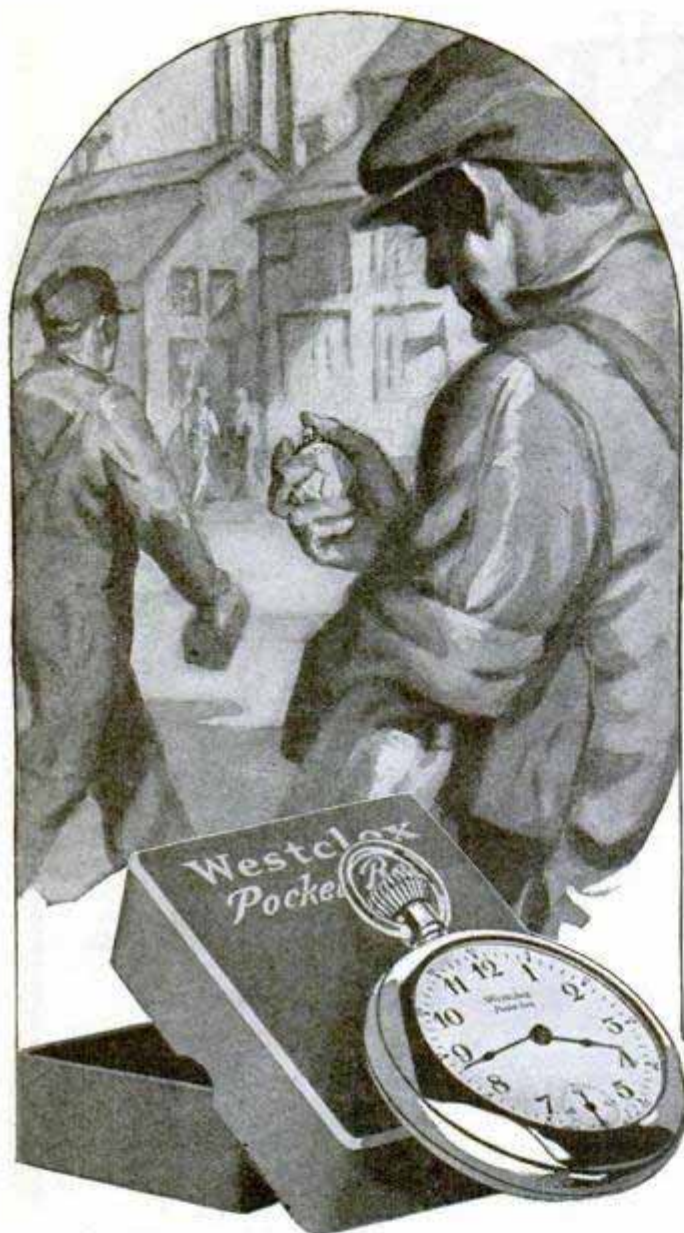
Street or R. F. D.....

City.....

State.....

MINIATURE SHIP MODELS

3818-20-22-24 Baring St., Philadelphia, Pa.



Pocket Ben

A sturdy
dependable watch

YOUR time is valuable; you want to be prompt; you need a watch you can depend on.

Pocket Ben tells the truth about starting time, meal time, bed time. Carry him wherever you go. He's as sturdy as he's good looking.

Pocket Ben is Big Ben's little brother. "Westclox" on his dial stands for good time-keeping.

Sold everywhere for \$1.50. With luminous night dial \$2.25

WESTERN CLOCK COMPANY
LA SALLE - - - ILLINOIS



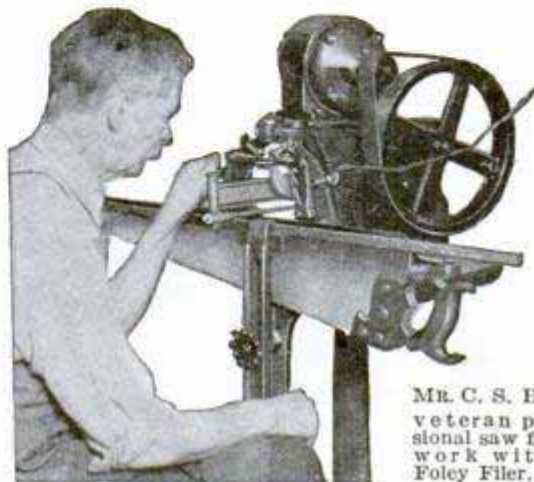
FILES A SAW In 5 Minutes

"Providing a saw is in fair condition, I run it through the Foley Filer *twice in 5 minutes, finished.* It does good work and saves my eyes. My customers are satisfied."

Chas. S. Harris, 342 5th Ave., Milwaukee, Wis.

You can have a business of your own—or make extra money in spare time. Write us today about Foley Automatic Saw Filers and Saw Setters.

FOLEY SAW TOOL CO., Inc.
215 Foley Bldg., 914 E. Lake St., Minneapolis, Minn.



MR. C. S. HARRIS,
veteran profes-
sional saw filer, at
work with his
Foley Filer.

SM

Do You Know the Secret of Quality Reproduction?

"The Secret of Quality" tells you simply and concisely how to get the most out of your amplifier—how to get quality. This 96 page booklet is yours for the asking—it's free. Write for your copy.

SILVER-MARSHALL, INC., 840 W. Jackson Blvd., Chicago, U.S.A.

Women Simply Can't Resist This Fast-Selling Line

Just show women this exquisite display of dress goods, silks, wash fabrics and you can't keep them from buying. Men and women agents needed to devote full or spare time. Good commissions. Average \$40 to \$85 a week. 1,000 samples furnished. Write quickly.

THE NATIONAL IMPORTING CO.
Dept. S-6, 569-573 Broadway, N. Y. C. 1000 Beautiful Samples



30 DAYS FREE TRIAL 7 Tube-Single Dial RADIO SET

**Write TODAY
for This Won-
derful Offer
Direct from
Factory!**

World's greatest radio. Perfect working, single dial control, 7-tube receiver, shipped to your home for 30 days' free trial. Test it for distance, volume and tonal quality—and if you are not convinced that it is the best single dial set you ever heard, return it to factory.

Metrodyne Super-Seven

Only one dial tunes in all stations. Get 1,000 to 3,000 miles on loud speaker. Easiest set to operate. Highest grade parts used. Magnificent Two-tone Walnut Cabinet.

Big Profits to Agents and Dealers

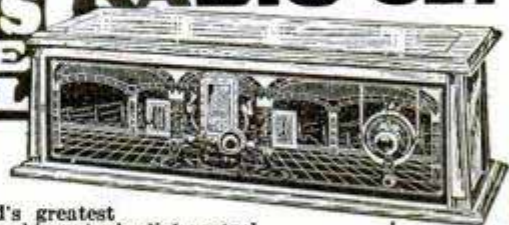
selling Metrodyne radios. All or part time. Great money making opportunity. Demonstrating set on 30 days' free trial. **WRITE FOR OUR OFFER.**

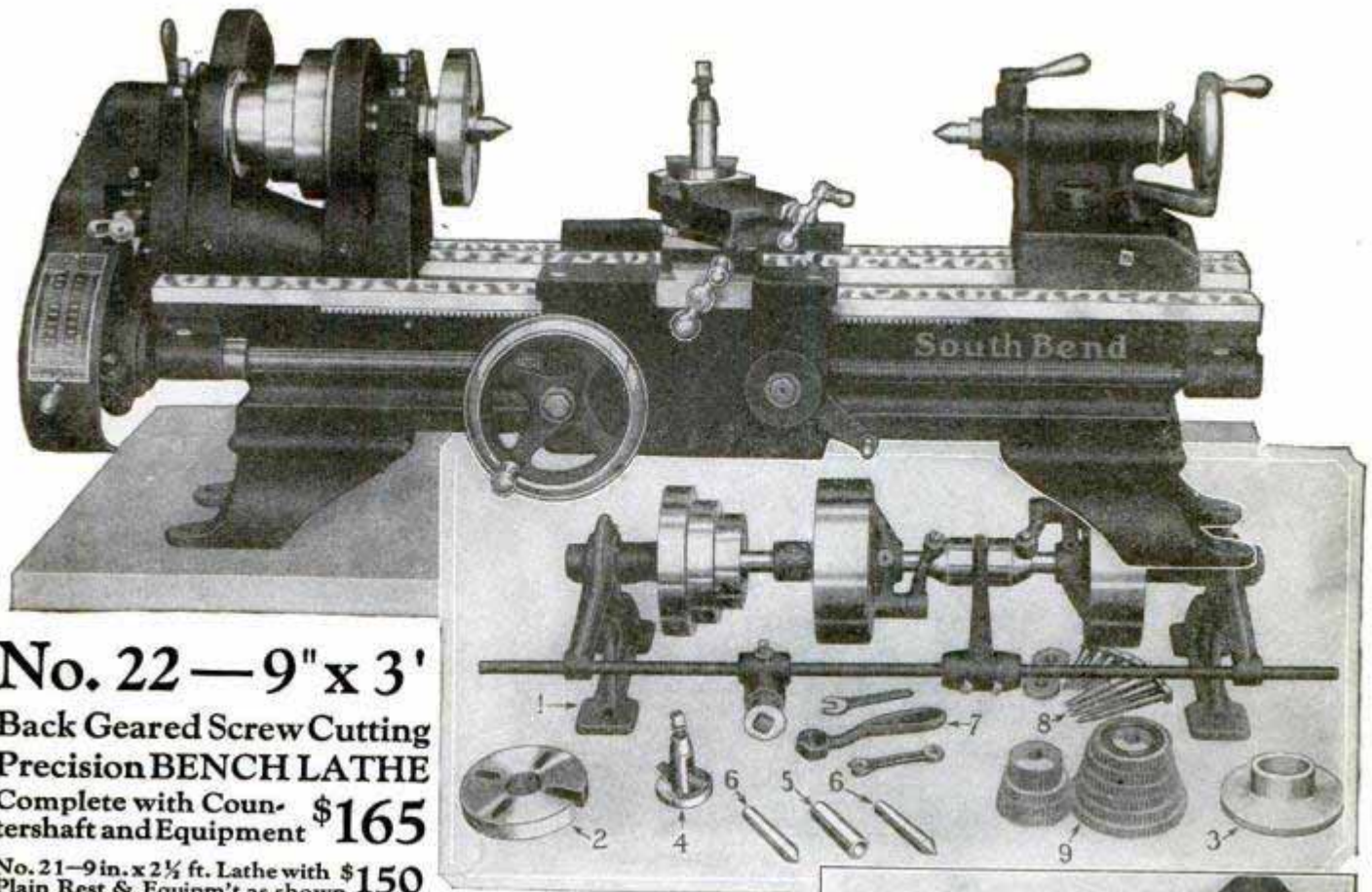
METRO ELECTRIC CO.

2161 N. California Ave., Dept. 145

CHICAGO, ILLINOIS

Retail Price
\$75
Completely
Assembled





No. 22—9" x 3'

Back Geared Screw Cutting
Precision BENCH LATHE
Complete with Countershaft and Equipment **\$165**

No. 21—9 in. x 2½ ft. Lathe with \$150 Plain Rest & Equipm't as shown

A Precision Lathe for Small Work

A precision screw cutting lathe used by repairmen, mechanics and small parts manufacturers. Will cut screw threads 4 to 40 per inch, bore, drill, ream, turn, chuck, turn tapers, etc. Hollow spindle for Draw-in Collet Chuck work.

Can Be Fitted With Many Attachments

Milling and Keyway Cutting Attachment, Taper Attachment, Electric Grinder, Draw-in Collet Chuck, Electric Mica Undercutter, Turrets, Lathe and Drill Chucks, Tools, Etc.

Motor Drive from Ordinary Lamp Socket

Illustrated on the right is the Self Contained Unit Motor Driven No. 22 Jr. Lathe complete with ¼-H. P. Reversing motor and Reversing Switch. Driven from an ordinary lamp socket.

BOOKLET No. 22 — Illustrates, describes and prices the No. 22 Jr. Lathe. Write for it today.

South Bend Lathe Works

New York City Sales-
room 183 Centre Street
N. Y.—Tel. Canal 9085

621 East Madison Street
South Bend, Indiana

Features

of the No. 22 Jr. Lathe

Back Geared Head Stock
Six Spindle Speeds
Phosphor Bronze Bearings
Power Feed to Carriage
Set-over Tail Stock for Taper Turning
Graduated Compound Rest
Micrometer Graduated Collar on Cross
Feed and Compound Rest Screws
Built in 3, 3½ and 4-foot bed lengths

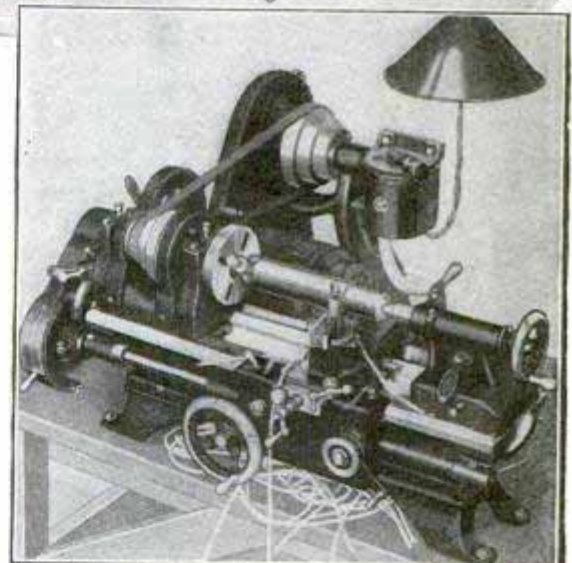
Time Payments if Desired.

The NEW Line of SOUTH BEND LATHES

The entire line of 96 types and sizes of South Bend Lathes has been completely redesigned in the last two years. The new lathes are heavier, stronger, and have greater belt power.

In 20 years, we have shipped 36,000
Lathes to 64 countries of the world.
The most popular sizes listed below:

Size of Lathe	Quick Change	Standard Change
9 in. x 3 ft.	\$258	\$228
11 in. x 4 ft.	308	268
13 in. x 5 ft.	387	337
16 in. x 8 ft.	553	493
18 in. x 10 ft.	746	681



No. 22 9 in. x 3 ft. Lathe complete with Self Contained Unit Motor Drive, with ¼-H. P. Single Phase Reversing Motor, Reversing Switch and Equipment - **\$250**

Specifications

of the No. 22 Jr. Lathe

Swing over Bed.....9¼ in.
Length of Bed.....3 ft.
Distance between Centers.....18 in.
Size of Centers.....No. 2 Morse Taper
Hole Thru Spindle.....¼ in.
Size of Spindle Nose, 1½ in. diameter
8 Threads
Precision Lead Screw ¼ in. diameter
8 Threads per in.
Thread Cutting Range. .4 to 40 per in.
Weight, Lathe and C'shaft....375 lbs.

Time Payments if Desired.

DEVITT 8" COMBINATION SAW

13 TOOLS IN ONE

Saw table raised, showing Emery wheel, saw guard and drill attachment.



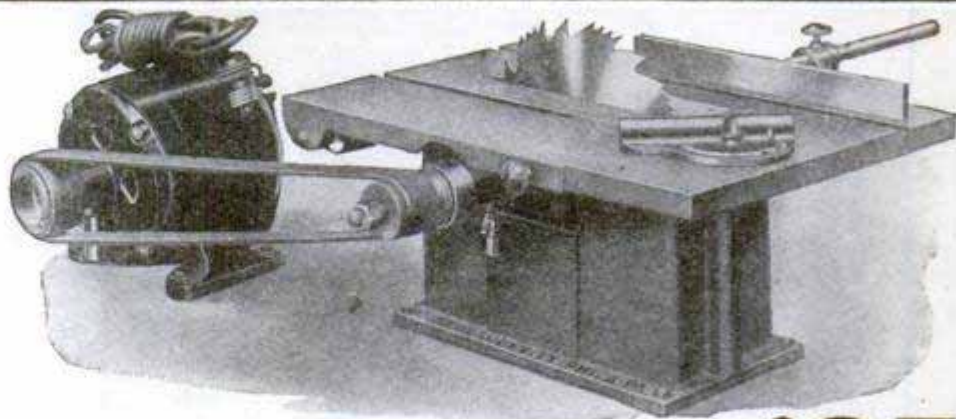
Planer attachment on saw table.

Showing Sanding disc attached.



Table tilted for beveling.

Dado head attached for grooving.



YOU save a great deal of money, time and space by buying a Devitt 8" Combination Saw. Why buy special tools for beveling, grooving, buffing, etc.? The Devitt Combination Saw will rip, cross cut, bevel, miter, groove, mortise, tenon, drill, rabbet, grind, buff and polish. The attachments are easily and quickly adjusted. The saw and motor when set up ready for work occupy very little room. The $\frac{1}{4}$ H. P. 60 cycle 110 volt A. C. motor can be run from a light socket and provide power for other purposes when the saw is not in use. A cut up to $2\frac{1}{4}$ " can be made with the 8" Combination Saw without planing. The ideal machine for shop, factory or home, complete with attachments: 12"x16" table, 8" Combination Saw, iron pulley for saw table, 10' ripping fence, adjustable cut off miter gauge, motor-specifications as above, $1\frac{1}{4}$ " endless leather belt, wood pulley, 8 ft. cord and plug, 6" buffing wheel, $\frac{3}{4}$ " 3 jaw drill chuck, 5" emery wheel, 6" sander, saw guard, and 2" dado insert. \$35.00 F. O. B. Phila. Height 16", shipping weight, 100 lbs. (Planer attachment to fit on table top will smooth pieces up to 2 in. wide, \$12.00 extra F. O. B. Phila.)

\$35
F. O. B. Phila.

Write for our beautifully illustrated 4 page circular.

PAUL J. DEVITT 1102 South 2nd Street
PHILADELPHIA, PA.



Gibson

Ralph Dexter
famous banjoist
N. Y. C. uses a Gibson

M.A.I.L. GIBSON, INC., 503 Parsons St., Kalamazoo, Mich. Gentlemen: Please send me the new Gibson book, free, illustrating and describing these most popular instruments, which I understand are chosen by leading professionals for their tone and playing qualities. Also give me details of your easy payment plan. I am interested in ☐ Banjos ☐ Guitars ☐ Mandolins ☐ Ukulele.

Name _____
St. _____
City _____
State _____

Tight Handles—Send for booklet "HOW to KEEP TOOL HANDLES TIGHT"
Fayette R. Plumb, Inc., 4857 James St., Philadelphia

PHOTO ENLARGEMENTS

Size 16x20 inches

Same price for full length or bust form, groups, landscapes, pet animals, etc., or enlargements of any part of group picture. Safe return of your own original photo guaranteed.

98¢

SEND NO MONEY

Just mail photo or snapshot (any size) and within a week you will receive your beautiful life-like enlargement, size 16x20 in., guaranteed fadeless. Pay postman 98¢ plus postage—or send \$1.00 with order and we pay postage.

Special Free Offer With each enlargement we will send FREE a hand-tinted miniature reproduction of photo sent. Take advantage now of this amazing offer and send your photo today.



UNITED PORTRAIT COMPANY
1652 Ogden Ave. Dept. 365 Chicago, Ill.

Build and Fly Model Aeroplanes



MINIATURE AEROPLANE FREE WITH EACH PLAN

A wonderful 6-in. flyer that does amazing stunts when thrown in the air. Order now and get one free.

Build your own Model Aeroplane; make trial flights and learn the principles of Aeronautics. IDEAL Scale Drawings and Building and Flying Instructions help you build exact 3-ft. duplicates of any of the following well-known Planes. Send 25c now for complete Plans for the one you want to build. Fokker North Pole Plane; De Havilland Battle Plane; Curtiss JN4D-2 Training Plane; NC-4 Naval Seaplane; Curtiss Military Tractor; Bleriot, Nieuport or Taube Monoplane; also Cecil Peoli Racers; 25 cents each, postpaid.

Catalogue IDEAL Model Aeroplanes and Supplies, 6c postpaid.

IDEAL AEROPLANE & SUPPLY CO., 408 West Broadway, corner Spring St., NEW YORK



ALL FREE

10 year guar. Watch with chain and ring, large Eastman Roll Film Camera or 22 cal. Hamilton Rifle, yours for introducing finest assorted liquid perfume at 15c a bottle. Send for 20 bottles and choose gift as per offer in our catalog. We trust you—just write to **BELL PERFUME CO., Dep. H153, Chicago, Ill.**

22 CAL. RIFLE



“Sorry, but I never lend my Starretts”

Whether it's for the day's work or for those thousand and one odd jobs 'round the house, or garage, men who really appreciate fine tools value their Starrett Tools above all others. They have learned that when a tool bears the name Starrett it'll do its particular job a bit better and keep on doing it longer.

Here are six Starrett Tools that most every man finds useful. Ask your tool dealer to show them to you. And write us for free copy of Catalog 23“AP” describing and illustrating these and 2200 others.

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS.

Starrett
Combination
Square
No. 94



Starrett
Nail Set
No. 265



Starrett
Universal
Scraper
No. 194



Starrett
Steel
Measuring
Tape
No. 530

Starrett
Pocket
Magazine
Screw
Driver
No. 560



Starrett
Hack Saw
Frame
No. 146



557



Use Starrett Tools



Mechanical Engineering

Learn at Home

MECHANICAL Engineering embraces the design, construction and operation of machines and machine tools.

It is a profession which offers almost unlimited opportunities for advancement to men who combine natural mechanical ability with special technical training.

For this is The Age of Machinery. Almost every convenience, luxury or necessity which we enjoy today depends on machinery for its production or adaptability to our needs. Every new invention multiplies the opportunities for competent designers, builders, erecting engineers, etc.

One of the best ways to train yourself to secure a position as a Mechanical Engineer is through the home-study courses of the International Correspondence Schools.

These courses are especially arranged to meet the needs of the student who studies at home. The theoretical work is stated in simple and clear language and engineering data is reduced to a form in which it is easily applied.

The courses are also particularly helpful because they are written by well-known mechanical engineers who have had years of practical experience in this field.

Just mark and mail the coupon and we'll gladly send you Free Booklets describing the I. C. S. courses in Mechanical Engineering or any other course in which you are interested.

Mail the Coupon for Free Booklet

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 5648-E, Scranton, Penna.

Without cost or obligation, please send me one of your booklets and tell me how I can qualify for the position or in the subject before which I have marked an X:

- | | |
|---|--|
| <input type="checkbox"/> Mechanical Engineering | <input type="checkbox"/> Machine Shop Work |
| <input type="checkbox"/> Mechanical Course | <input type="checkbox"/> Toolmaking |
| <input type="checkbox"/> Draftsmen's Course | <input type="checkbox"/> Blacksmithing and Forging |
| <input type="checkbox"/> Mechanical Drawing | <input type="checkbox"/> Patternmaking |
| <input type="checkbox"/> Shop Practice | <input type="checkbox"/> Foundry Work |

- | | |
|--|---|
| <input type="checkbox"/> Steam Engineering | <input type="checkbox"/> Boilermakers |
| <input type="checkbox"/> Marine Engineering | <input type="checkbox"/> Boilermakers' Laying Out |
| <input type="checkbox"/> Internal Combustion Engines | <input type="checkbox"/> Sheet-Metal Workers |
| <input type="checkbox"/> Aeroplane Engines | <input type="checkbox"/> Sheet-Metal Pattern Drafting |
| <input type="checkbox"/> Diesel Engines | <input type="checkbox"/> Architecture |
| <input type="checkbox"/> Refrigeration | <input type="checkbox"/> Architectural Draftsman |
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Architects' Blueprints |
| <input type="checkbox"/> Power House Electric | <input type="checkbox"/> Contractor and Builder |
| <input type="checkbox"/> Electric Lighting | <input type="checkbox"/> Concrete Builder |
| <input type="checkbox"/> Practical Electricians | <input type="checkbox"/> Plumbing |
| <input type="checkbox"/> Radio | <input type="checkbox"/> Heating and Ventilating |
| <input type="checkbox"/> Civil Engineering | <input type="checkbox"/> Agriculture and Poultry |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Structural Engineering | <input type="checkbox"/> High School Subjects |
| <input type="checkbox"/> Structural Drafting | <input type="checkbox"/> Common School Subjects |
| <input type="checkbox"/> Mining | <input type="checkbox"/> Business English |
| <input type="checkbox"/> Metallurgy | <input type="checkbox"/> Bookkeeping |
| <input type="checkbox"/> Chemistry <input type="checkbox"/> Pharmacy | <input type="checkbox"/> Stenography and Typing |
| <input type="checkbox"/> Civil Service | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Salesmanship | <input type="checkbox"/> Business Law |
| <input type="checkbox"/> Advertising | <input type="checkbox"/> Illustrating |
| <input type="checkbox"/> Better Letters | <input type="checkbox"/> Art Drawing |
| <input type="checkbox"/> Spanish <input type="checkbox"/> French | <input type="checkbox"/> Cartooning |

Name.....

Street Address.....

City.....State.....

Persons residing in Canada should send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada.

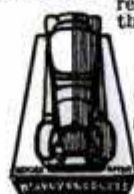
McAVOY SHOP

DISTRIBUTORS make BIG MONEY!

Distributors wanted to open McAvoy Shops. You can't refinish cars fast enough to keep up with the demand for McAvoy Quick Quality Finish, at \$10 to \$25 a car. Cars ready in one day, a guaranteed job.

RE-FINISH CARS in \$10 to \$25

Approved by many auto makers and by thousands of car owners, as the finest quality lustre and most lasting finish. Will not turn gray, will not chip or check. Applied over paint, Duco or Lacquer. Invented by Delmar McAvoy, a recognized authority on motor car finish, throughout the auto industry.

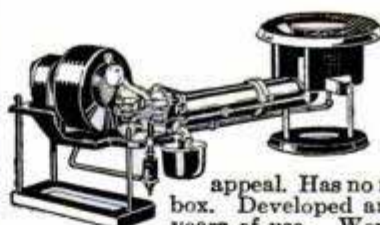


McAVOY QUICK QUALITY FINISH

Here and Everywhere

Over 300 shops operating at big profits in U. S., Canada, and Europe. Write today. Tomorrow the territory you want may be taken. Capital required for franchise is according to the cars listed in your territory.

THE McAVOY MFG. CO., Inc.
105 McAvoy Bldg., 920 W. Milwaukee Ave., Detroit, Mich.



Roberts Oil Burner

THE Roberts Oil Burner is a product of merit with a price

appeal. Has no moving object in the fire box. Developed and tested through nine years of use. Works well on any heating equipment. It is dependable, simple, efficient. Write today for territory and sales plan.

ROBERTS SALES & ENGINEERING CO.
DEPT. 53, 740 MELDRUM AVE., DETROIT, MICHIGAN
Also Manufacturers of Roberts Metallic Bath Tubs.

FREE—OUR NEW 84-PAGE CATALOGUE. FILLED WITH RADIO BARGAINS. Write Today!

RANDOLPH RADIO CORP.

180 N. Union Ave. Dept. 237 Chicago, Ill.

Balkite Radio Power Units

FANSTEEL PRODUCTS CO., Inc., North Chicago, Ill.

Cheapest Way to Go

to work or school and recreation is on a Mead bicycle. You can have your choice of 44 Styles, colors and sizes. 30 DAYS FREE TRIAL.

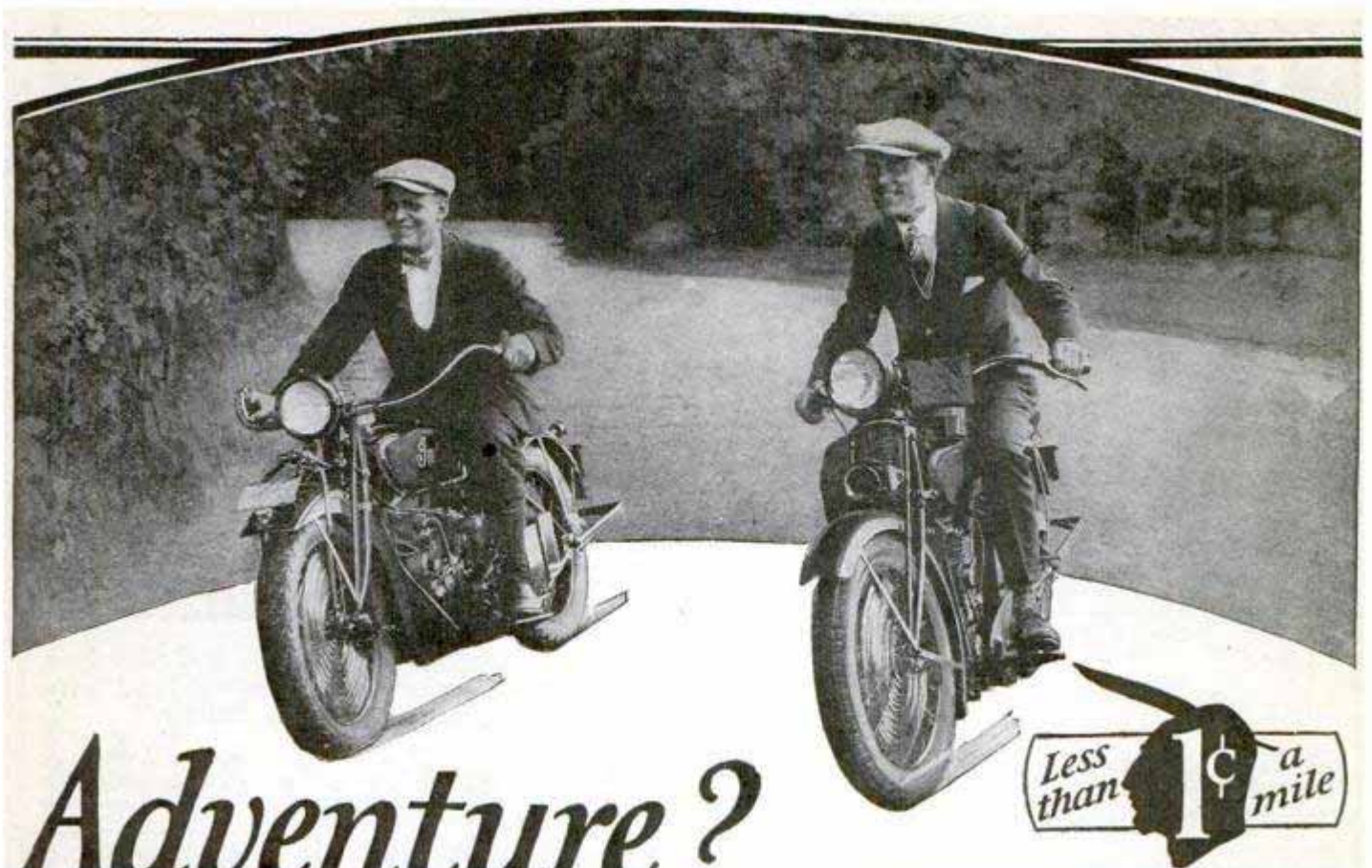
Factory to Rider Do business direct with the makers. We ship on approval. Save time and money. Prices from \$21.50.

Tires best quality, factory prices. Save big money on Lamps, wheels and equipment, low prices. Send No Money, do business direct with makers.

Mead CYCLE COMPANY
DEPT. 110 CHICAGO

Write today for free Catalog, factory prices and marvelous new offer.





Adventure? -loads of it

Never a dull day with these
two famous Indian "pals"!

GET READY! You're off on an Indian—for healthful, thrill-packed days; for comfortable travel at less than carfare; for quick trips to business or pleasure in the "peppy" outdoor air!

Either model is a winner, the Prince or the Scout. Smooth, quiet, easily handled—dependable every minute on the road. Go anywhere with these famous "pals", any time, at a fraction of carfare cost—a cent a mile

or less. Until then you'll never know real motoring at its best!

**Easy to Own—
Let Us Prove It!**

Visit your nearest Indian dealer and learn how easily you can own an Indian under our pay-as-you-ride plan. Or mail coupon for FREE illustrated booklet telling complete story. No obligation.

Dealers! A few good territories still open. Real opportunity for ambitious men. Write now!

Indian Motorcycle Co.

SPRINGFIELD, MASS.

Check nearest age to help us suggest
the model for your requirements.

THE INDIAN PRINCE

The Solo Single

Learn to ride in 5 minutes. Climbs steepest hill on high. Speeds from 5 to 50 miles per hour. Low saddle, 3-speed transmission. Two-unit electrical system. Light, sturdy. 90 miles per gallon. Less than 1¢ per mile operating cost. Price with complete electrical equipment \$225 F. O. B. Springfield, Mass.

INDIAN SCOUT

The Solo Twin

Twin-cylinder smoothness, acceleration and power, combined with light weight, low saddle, ease of handling. 65 miles per gallon. 1¢ per mile. Highest used-value. Thousands delivered 7 years ago in use today. Price with complete electrical equipment \$285 F.O.B. Springfield, Mass.

Motor the Indian Way

Lowest initial cost!
Lowest upkeep!
No garage bills!
No traffic delays!

Indian Motorcycle Co.,
Dept. P-5, Springfield, Mass.

☐ Send me your illustrated Catalog describing the Prince and the Scout.

☐ Check this square if you are interested in our money-making proposition to dealers.

Name _____

Address _____

City _____

State _____

Age 12 to 16 ☐

16 to 20 ☐

over 20 ☐

"Why-It's a Whole Machine Shop!"



This Amazing 17-Ounce Tool Conquers 60-Lb. Kit!

The most revolutionary hand tool ever invented. Does the work of other tools costing over \$50—truly a tool of 1000 uses. Just the "hand-grip" of a tiny rubber band holds a hard bearing ball—the hardest-to-hold thing known—against a 300 Pound Pull!

Grips with 1 Ton Direct—128 Tons Per Sq. In. Pressures through its 10-to-1 Leverage Power-Gear Transmission. In addition, the Grip LOCKS!

Among Thousands of Large Users are the MAKERS of Buick, Chevrolet, Nash, Packard, Reo, Studebaker, etc. Automobiles, Fisher Bodies, etc.; who with their employees have bought Kits in quantities of 500 to 1000! Studebaker has approved it for use in its Service Stations throughout the World. Thousands of housewives are using it too, because it does so many useful and amazing things so easily, so instantly. And even a woman's hand applies a HALF-TON Giant's Grip! Every Auto and Home Owner—every man who ever uses any tools needs it every day.

World Flight Equipment

It was standard equipment for the U. S. WORLD FLIGHT and the U. S. S. Shenandoah. Creates a sensation everywhere. Just its astounding 1-Ton Grip makes it worth ten times its cost.

The amazing EIFEL-FLASH PlierRench is a true Ratchet WRENCH—Parallel Pliers—Speed VISE, and more. Instantly and automatically it LOCKS its death-grip Jaws on the

AGENTS \$200 a Week

PlierRench representatives earn amazing incomes demonstrating this wonderful new tool. One man alone sold nearly 10,000 in just one state. Fastest seller known. Factories buy by hundreds. Every auto and home owner buys. We have wonderful special proposition to agents. Mail coupon for full details. Why not earn \$75 to \$200 and more a week, spare or full time?

Whole Kit in 1 Tool

You get in a Royal Blue Leatherette HOLDER, the 8½" Universal PlierRench with 2 EXTRA Jaws—a PIPE Jaw—and a WIRE Jaw—each giving undreamed of performance. Instantly (in 1/5 second) you insert the Jaw you need, and as quickly snap a One-Ton Grip on work of any possible kind, or shape, or size from 0-in. to 1½-in. And—nothing Ever can get away from that grip! HAVE YOU EVER HEARD OF A TOOL THAT WORKS LIKE THIS—it actually out-grips a 40-lb. Vise, and applies a 1-TON grip at the very jaw-tips. Will remove broken studs, taps, drills, etc., with next-to-nothing to hold on. Yet its smooth grip will hold a hair and coil a spring of hair-fine piano wire!



The Universal PlierRench

For every kind of Pliers, Nut Wrench, Vise, Clamp, and Spring-making Work—Everywhere.



The Pipe PlierRench

For every kind of Pipe Wrench and Pliers Work; Chewed Nuts that no other tools can budge, etc.



The Wire PlierRench

For every kind of Wire, Tire Chain, Cable and Spring Work; and the Special work other Tools won't do.

Guaranteed

The PlierRench KIT is positively guaranteed.

It has stood the most trying tests of time and service. Of thousands—the First Commander of the U. S. World Flight said—"It should form part of the equipment of each and every Airplane and Automobile." One Engineer said—"I have used my PlierRench for 5 years and wouldn't be without it for \$100—and I mean it!"

Special Introductory PRICE \$3⁶⁵ ONLY

Regular Price \$5.00

Thousands fortunate enough to be able to see the astonishing performance of this marvelous PlierRench KIT are glad to pay the regular price of \$5.00. You can TRY this amazing performance on your own work in your own way for 2 weeks, and if the PlierRench KIT has not EARNED FOR YOU in that time the value of its price—just return it, and your money will be refunded as fast as the mails can carry it. Also, with your PlierRench KIT you receive a valuable Manual of Mechanics that every man should have. It tells in 64 pages and 145 illustrations some of the marvels of "The PlierRench Way"—the quicker, better, and easier way to do every kind of mechanical work.

Make use of the Coupon below, get this incomparably better tool KIT for the price of just one ordinary tool—let the marvelous PlierRench with its versatile 3 Jaws SPEAK FOR ITSELF as no Steel Jaws ever spoke before!



MAIL TODAY!

THE FLASH SALES CORP'N

EP-4809 N. Ashland Ave., CHICAGO, ILLINOIS



THE FLASH SALES CORP'N, EP-4809 N. Ashland Ave., Chicago, Ill.

1. Rush your amazing new Eifel-Flash PlierRench KIT. I will pay postman 45¢ on arrival (U. S. A. Post). It is underwooded! I may return kit within 2 weeks and get My Money Back, if not delighted.

2. Send me user literature.

3. Am interested in Salesman's Big Proposition.

Name _____ P. F. D. _____

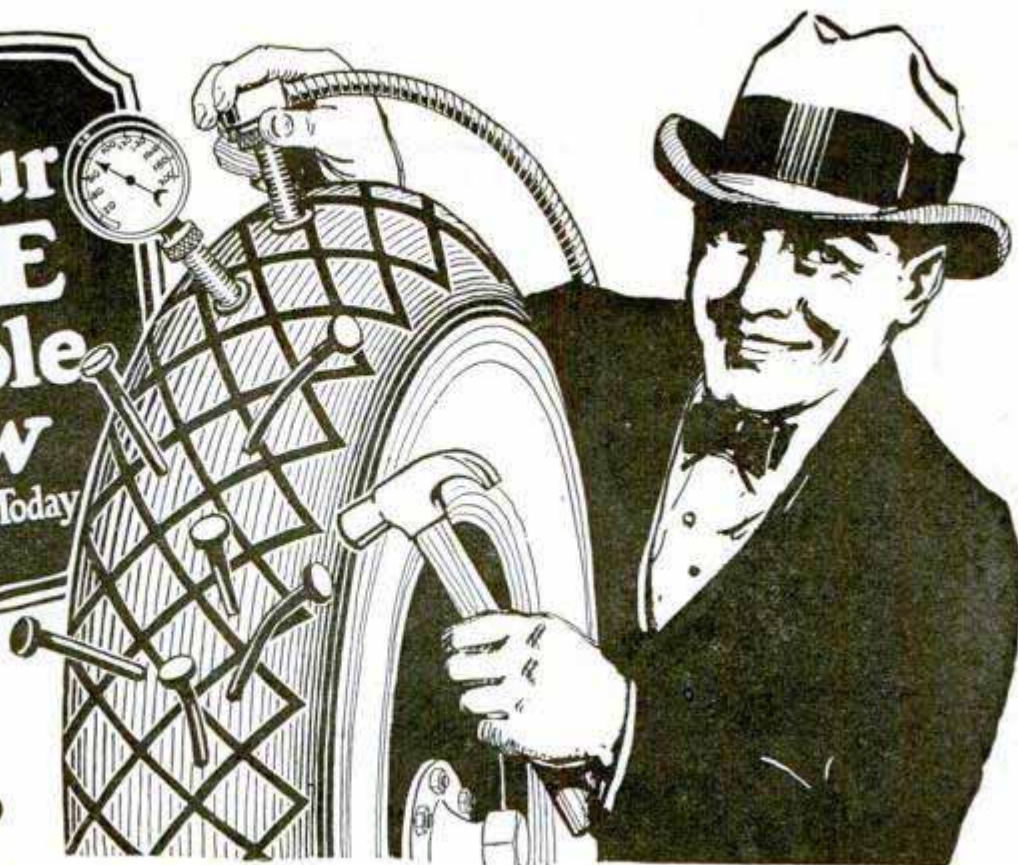
St. _____ P. O. _____ City _____ State _____

FREE



Every person using the coupon to order a PlierRench KIT will receive absolutely FREE our wonderful E-F ANGLE Screwdriver. It has 7 working edges 1.8-in. to ¼-in. wide and is so strong it does the work of many screwdrivers—large and small. Handles auto lights and removes bottle caps. Fits keyring and key-tainer. "The World's Greatest Small Tool"—yours FREE with the KIT

Get Your
FREE
Sample
NOW
Mail Coupon Today



These Startling Demonstrations Amaze Thousands Daily!



**Tires Hammered Full of Nails,
Leaked NO Air. GALACITE a new
Viscous Pneumatic Compound
(Not a Liquid)**

Seals PUNCTURES Instantly

—the very moment they occur. One application made in a minute without taking tire off wheel or rim does the work. Galacite is not a Tire Filler—You Ride on Air the same as ever—only enough is used to thoroughly coat the inside of the Tube. Not only will Galacite Seal Punctures but Slow Leaks and Porous Tubes as well. It will not injure Tire or Tube. On the contrary Galacite aids in preserving rubber. Its use often Doubling Tire Life. The India Rubber and Tire Review—leading paper of the Rubber Trade says regarding Galacite tests made by noted authorities: "The results of actual tests are in agreement with the contention of the Manufacturer—that a pneumatic tire (mentioning Galacite treated tires) has been produced that is practically proof against puncture by nails." Don't confuse Galacite with anything else ever intended for the same purpose. It is new, different, clean, and scientifically correct, manufactured by a long established, highly rated, financially responsible concern.

OVER 500 PUNCTURES—NO AIR LOSS

Walter Dhooge, of Mass., writes that he has punctured one of his tires over 500 times and that it still holds its pressure. George Greutz of South Dakota writes that he drove over 12,500 miles in one year without a Flat Tire and that his tires still are in perfect condition. Fred Morris writes us that he has driven over 2,100 miles with a nail in each tire without adding a pound of Air. We have received Hundreds of letters like this.

AGENTS BIG—QUICK PROFITS \$150 IN A WEEK

Get the Facts and Get Them NOW—you can make immediate-sure-steady profits that are amazing—no lengthy arguments—a demonstration does the selling. We back our agents with powerful advertising helps—Cloth Banners, Posters, Newspaper Ads, and Circulars printed with your Name and Address. Joe Guzzie writes: "Disposed of half a gross on day received. Rush five gross more." George Benter wires—"Sold first two firms called on, no more stock. Rush gross today." Charles Seals writes—"Have made from one to three sales for every nail driven." James Bernhart says—"Galacite making a hit. Rush another gross today."

C. F. Johnson & Co., 19 W. Jackson Blvd., Dept. 557, Chicago

POWERFUL AND DRAMATIC SELLING DEMONSTRATIONS

You can stick the Special Needle Valve shown above Right through the Tread of a Galacite Treated Demonstration Tire and Inflate or Deflate the tire and Test the Air Pressure, just as you would with an ordinary Valve. When the needle valve is withdrawn Galacite acts just as it would as if a nail had been driven into the tire and pulled out. **NOW DON'T GET THE WRONG IMPRESSION.** This is a demonstration feature only. Your customers are not required or supposed to inflate their tires in this unusual manner—but in the usual way through the regular tire valve. We have devised this remarkable demonstration to enable our distributors to instantly Prove the tremendously efficient air sealing properties of Galacite and Prove it in such an impressive and dramatic manner that it can never be forgotten.

ACT NOW!

Send No Money—Just mail the coupon and we will send you by return mail postpaid a **FREE SAMPLE** of Galacite together with our Big Book illustrated in colors and Full Particulars. Don't put it off. Mail the Coupon for your free Sample NOW—hours—even minutes count.

Copyright 1927, C. F. J. & Co., Chicago, U. S. A.

SEND COUPON

FOR FREE SAMPLE

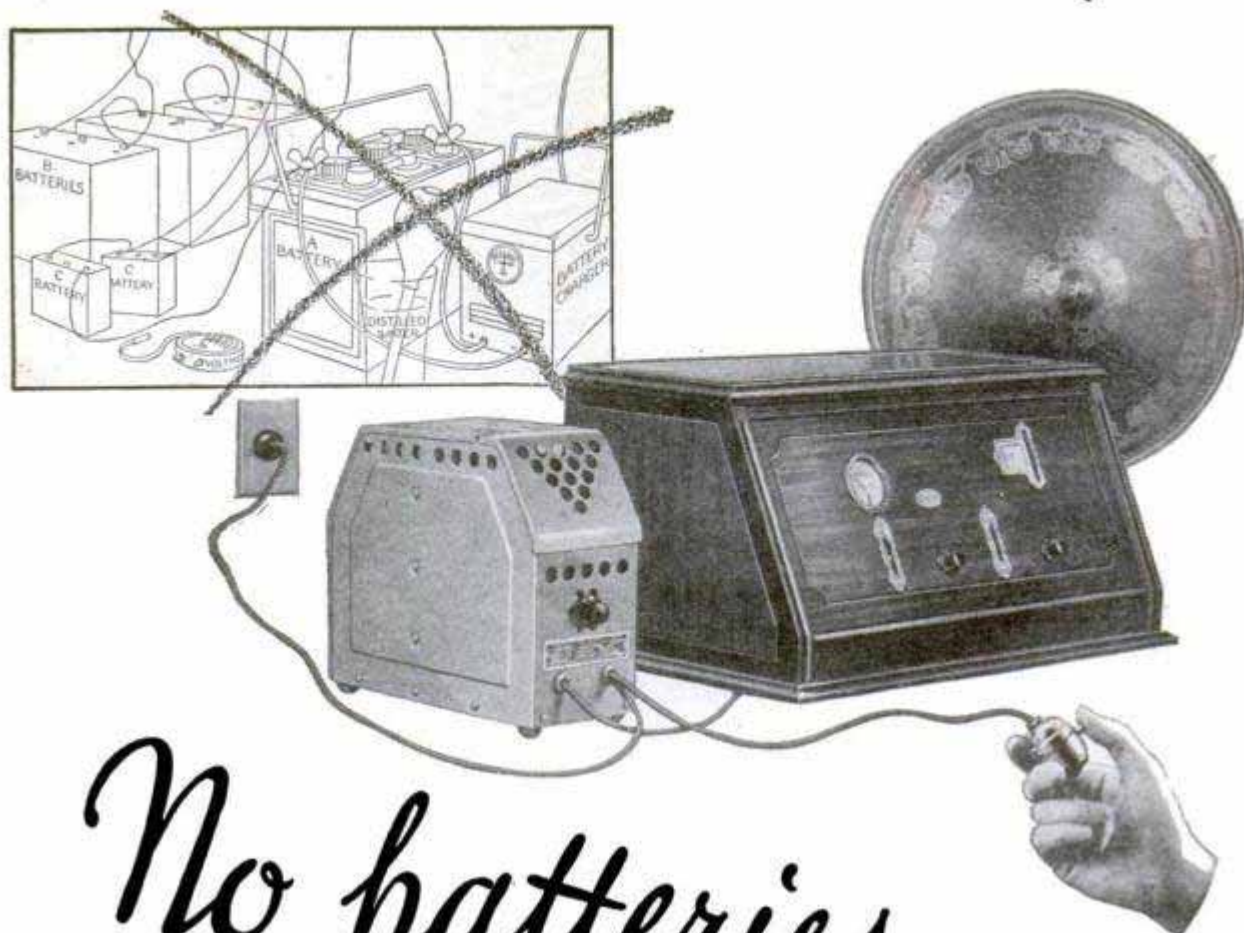
**C. F. JOHNSON & CO., Dept. 557,
19 W. Jackson Blvd., Chicago, U. S. A.**

Without any obligation, send me by return mail postpaid a **FREE SAMPLE** of Galacite together with your **BIG BOOK** and other important information.

Name.....

Address.....

City..... State.....



No batteries—

Radio's most revolutionary development! Run this radio direct from house current outlet. Ordinary 110 volt 60 cycle domestic electricity transformed mechanically into smooth, quiet radio A, B and C power as you use it. Radio power supply annoyances ended for all time. A snap of the switch is the only demand radio will make upon you from NOW ON.

No more batteries to fuss with.
No more trickle chargers to watch.
No more keeping something filled with water.
No batteries to renew or recharge.
No upsetting the home to have the radio serviced.

See these wonderful sets at any Crosley dealers, or write Dept. 15 for descriptive literature.

The CROSLY RADIO CORPORATION
Powel Crosley, Jr. President
CINCINNATI, OHIO

Radio Energy Unit

Crosley Radio Energy Unit weighs only 13 lbs., is only half the size of an ordinary "A" storage battery—operates without interfering hum and with the certainty of an electric motor.

\$50

6-tube AC Receivers

for use with Crosley Radio Energy Unit

Crosley radios designed for use with this marvelous power supply are the AC-7, a 6-tube, table model at \$70 and the AC-7-C, a 6-tube console at \$95.

Crosley sets are licensed under Armstrong U. S. Patent No. 1,113,149, or under patent applications of Radio Frequency Laboratories, Inc., and other patents issued and pending. Price slightly higher west of the Rocky Mountains

CROSLY

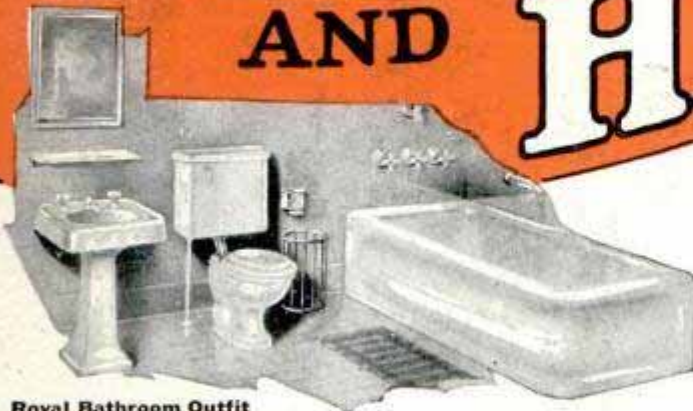
RADIO

**CROSLY
ULTRA
MUSICONE
\$9.75**

LOWER WHOLESALE PRICES
THAN EVER BEFORE
On Highest Quality,

**INSTALL
YOUR
OWN**

PLUMBING AND HEATING

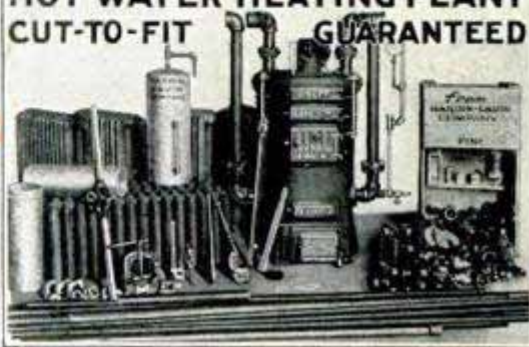


Royal Bathroom Outfit

**EASY
TERMS**
**SAVE
HALF**
**FREE
PLANNING
SERVICE**

The Hardin-Lavin Company
 founded over 50 years ago
 has from the beginning specialized
 in Highest Grade Plumbing and Heat-
 ing to the consumer direct at wholesale. Our newest catalog
 is just off the press and brim full of bigger bargains than ever before. Send for
 your copy today. Lower
 wholesale prices than we
 have ever quoted will save
 you from one-third to one-
 half on everything in
 Plumbing and Heating.

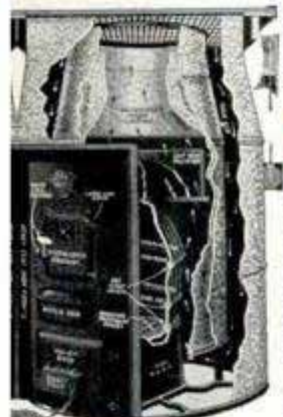
**HOT WATER HEATING PLANT
CUT-TO-FIT GUARANTEED**



Complete Hot Water Heating Plant ready
 for shipment with set of installing tools,
 diagrams, and New Easy Method of self-
 installing instructions. Com-
 plete outfits as low as \$200

Top Quality — Bottom Prices

Our vast buying power, nearness to raw material market, our centrally located plant and com-
 plete shipping facilities combine to give you bottom prices on top quality goods. Every Plumb-
 ing Outfit or Heating Plant you buy from us has behind it our Bonded Guarantee, our million
 dollar plants and our reputation for 50 years' economy service to experi-
 enced buyers. A transaction with us is not completed until your order has
 reached you in perfect condition and is installed and working satisfactorily.
 We have built our business by adding extra service to special values
 and developing and perfecting the now famous Hardin-Lavin New Easy
 Method of self-installing which means to you time and money saved



PIPELESS HEATING PLANT

Grade A Quality Guaranteed Plumbing Outfits

In our new catalog just issued, you will find everything in lat-
 est designs of Plumbing Fixtures and Heating Supplies:—
 Built-in Tubs, Pedestal Lavatories, One Piece Deep Apron
 Kitchen Sinks, Laundry Tubs, Hot Water Heating Plants,
 Steam Heating Plants, Pipeless Heating Plants and Warm
 Air Pipe Heating Plants as well as Fixtures, Radiators,
 Accessories, Pipe, Fittings, etc., all of the highest quality
 possible to manufacture at Lowest Wholesale Prices. Hardin-
 Lavin New Easy Method of self-installing enables you to put
 in your own Plumbing or Heating. No experience needed to fol-
 low this new method which saves you days and dollars. Crystal-
 clear diagrams and instructions guide you every step of the way.
 All materials come to you factory-fitted and ready for quick assem-
 bly. There is no guess work and when the job is finished an expert
 will approve it.

Special! Deferred Payments

In addition to quality goods at wholesale prices, new easy installing method,
 free plans, and all the other Hardin-Lavin advantages, we have now arranged
 so that you can BUY ON EASY TERMS. Nowhere else can you find so unusual
 and complete a combination of merchandise, service and accommodation.
 Added to all this—without charge—is the co-operation of our corps
 of Engineering Experts.

Our Label and Bonded Guarantee Protects You Fully!



ON. Everything you buy from us is backed by this label and our
 bonded guarantee.

MAIL COUPON TODAY FOR FREE BARGAIN CATALOG



WATER SUPPLY
SYSTEM

Thousands of customers testify to the fact that we have saved them money, time, expense and dissatisfaction. You take
 no risk when you buy a Heating Plant or Plumbing Outfit from us because our engineering staff has okeyed everything
 before it leaves our plant. **ASK FOR FREE ESTIMATE.** Let this trained group of Plumbing and Heating Engineers
 help you. Write them freely for advice and information. Ask for estimate without obligation. Send a rough sketch of
 the arrangement of your rooms if possible and they will design an outfit exactly for your home that will meet all of your
 individual needs. Thousands of home owners, contractors, farmers, mechanics and nationally known institutions have
 opted from these made-to-order Hardin-Lavin designs. This help from our engineering staff is free and backed by 50
 years of knowing how. They will show you many trade secrets, kinks and wrinkles that will surprise you with big sav-
 ings of money, time and labor. **WRITE TODAY.**



Send for
Your
**FREE
Copy
Today**

**FULL OF
BIG BARGAINS!**

**Hardin-Lavin Company,
107-17 W. Pershing Road,
Chicago, Illinois.**

P. M.-5-27

Gentlemen: Please send me your free bargain catalog with spe-
 cial wholesale prices and easy terms. I am interested in:

- | | |
|---|---|
| <input type="checkbox"/> Hot Water Heating Plants | <input type="checkbox"/> Warm Air Furnaces |
| <input type="checkbox"/> Steam Heating Plants | <input type="checkbox"/> Water Supply Systems |
| <input type="checkbox"/> Pipeless Heating Plant | <input type="checkbox"/> Bathroom Outfits |

NAME

ADDRESS

CITY.....STATE.....

*You can buy
on Easy
Terms*

Highest Quality HARDIN-LAVIN CO. Lowest Prices
 107-17 W. PERSHING ROAD, EST. 1876 CHICAGO, ILLINOIS

Tire Agents

\$15 a Day in Spare Time

Albert McKnight, Monmouth, Ill., made Cash \$15.00 just showing selling outfit. "I took these orders in 1 hour," says McKnight.

Here's an amazing opportunity, where there is open territory, for new Mellinger Men. Your spare time will pay you a big income. Each man has approximately 4,000 cars to serve and a total \$200,000 business. You have no stock to carry, no expense, no collection, no delivery. You don't need selling experience or tire knowledge. Many biggest earners

are clerks, farmers, etc. Estrado, California, orders \$1500.00 one week, a little later repeats with \$1000.00. Garman, Michigan, makes \$43.10 clear the first day; Silas, Miss., sells 25 tires first week. Hill, Mich., made \$100 first month. New Process, Melenium Cured Tires—Better tires for less money—is the Easy Road to Agents' fortunes.

Tires for Demonstrating

are equipped with a marvelous \$10 outfit that does all the selling work. You have exclusive territory and are part of the great prosperous nationwide Mellinger organization. The Emblem shown is your passport to public confidence. National and local advertising, free sales training, no risk, no expense, tires for your own car. Good agents promoted to field managers.

If you have a car so much the better. You can equip it with demonstrating tires. You

15,000

Miles Guaranteed

The only company giving a legal binding contract which guarantees mileage.

Users pay only for actual miles of service.

Easy riding, superb appearance, tremendous economy. And trouble proof. Think of this supreme test. A regular stock tire properly inflated and mounted was dropped from half mile high airplane.

Shock dug a hole in the ground, but tire uninjured, now in daily use on aviator's car.

New Process Doubles Mileage

Melenium curing is the amazing new process that doubles the life of tires by preventing rubber rot. Mellinger Melenium cured tires, cords and balloons, live twice as long. 20,000 to 30,000 miles ordinary records.

Naturally car owners would expect to pay more but actually they pay less for these super-tires. That is due to the Mellinger plan of one-step distribution, eliminating many Jobbers' and retail profits.



MAIL COUPON TODAY!

Mellinger, Dept. 601

WRITE
NEAREST
OFFICE

Dept. 601
Dept. 601
Dept. 601

Kansas City, Mo.
Philadelphia, Pa.
Oakland, Calif.

Without cost or obligation, send amazing free offer.

Name

Address



Send for this Master Outfit!

See the great \$10.00 Mellinger Salesman's outfit—A beautiful traveling case containing sample sections, selling helps, literature, etc. If you would like to try Mellinger Tires on your own car, or if interested in Agency, write today.

FREE SAMPLES

Be the first in your locality to receive this amazing offer and free samples Melenium cured rubber. All car owners are invited to test Mellinger guaranteed tires, cords or balloons. All active ambitious men write for full details of money making offer. No cost—no obligation; simply send name today.

B. L. MELLINGER, President

MELLINGER TIRE & RUBBER CO.

Dept. 601, KANSAS CITY, MO.
Dept. 601, PHILADELPHIA, PA.
Dept. 601, OAKLAND, CALIF.

WRITE NEAREST
OFFICE

Capital \$600,000

References: Any bank or Trust Co., or any publication